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THE

REPERTORY

OF

PATENT INVENTIONS,

AND OTHER

Discoveries and Improvements

IN

ARTS, MANUFACTURES,

AND

AGRICULTURE;

BEING A CONTINUATION, ON AN ENLARGED PLAN,

OF THE

Repertory of Arts and Manufactures:

A WORK ORIGINALLY UNDERTAKEN IN THE YEAR 1794, AND STILL CARRIED ON, WITH A VIEW TO COLLECT, RECORD, AND BRING INTO PUBLIC NOTICE, THE USEFUL INVENTIONS OF ALL NATIONS.

ENLARGED SERIES.—VOL. XXIII.

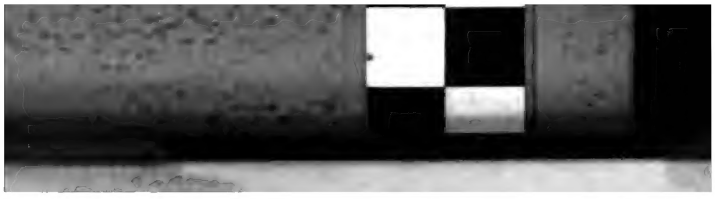
January—June, 1854.

LONDON:

PUBLISHED FOR THE PROPRIETOR,

BY ALEXANDER MACINTOSH, GREAT NEW-STREET;

AND SOLD BY SIMPKIN, MARSHALL, AND CO., STATIONERS' HALL COURT; J. WEALE, HIGH HOLBORN; AND G. HEBERT, CHEAPSIDE.



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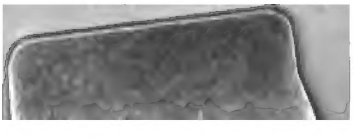

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ALEXANDER MACINTOSH,

PRINTER,

GREAT NEW-STREET, LONDON.

THE

REPERTORY

OF

PATENT INVENTIONS.

No. 1. Vol. XXIII. ENLARGED SERIES.—JANUARY, 1854.

Specification of the Patent granted to James Newall, *of Bury, in the County of Lancaster, Railway Carriage Builder, for Improvements in Breaks, Machinery, or Apparatus applied to Railway or other Carriages in Motion, and in the Mode or Method of Connecting Two or more of such Breaks together.*—Dated December 3, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention relates to improvements in the mode or method of working or applying breaks to the wheels of carriages in motion when it is necessary to stop or retard their progress or velocity. It is self-acting, so far as not requiring the power or assistance of an attendant to attach or apply the break blocks to the wheels, it being only requisite to release a catch for that purpose, and to turn a wheel or screw, or raise a lever or some similar contrivance, to detach them before the wheels are set in motion. My plan is applicable to work the usual slide-break now in general use on railway carriages, or it may be applied

to any other kind of breaks. The only improvement I claim in the construction of the break itself, is to make all the joints conical, so that as any of them become slack or loose by wear and friction, they can be tightened, and thus prevent the severe wear and tear by the derangement of the several parts when one joint becomes loose. It is also applicable to the working or applying the breaks to carriages on railways or on common roads, and to one, two, or more wheels of the same carriage; it may be applied to one carriage only, or, by a mechanical contrivance hereafter explained, to any reasonable number of carriages, so connected as to enable one man to detach or work them with perfect ease and safety. This my improved plan is so far self-acting, as before stated, that if a portion of a train should become detached whilst ascending an incline, the separation itself will cause the breaks to apply their power to the wheels of the detached carriages, although there should be no person in charge of them, and thus prevent danger of collisions by stopping or retarding their velocity, which would otherwise be fearful down an incline. I work the common slide-break to one carriage, as follows:—I attach a lever to the centre shaft of the break, the said lever extending to or a little beyond the end of the carriage: this lever acts upon the break shaft, so that when it is lifted up it detaches the break blocks from the wheels, and when it is allowed to fall down it forces the blocks to the wheels by its own weight or gravity. As the power of this lever will depend upon its length, and the force or power acted upon its extreme point, by fixing a weight on the end of it, and allowing it to fall, the force or power of the blocks against the periphery of the wheels will be in proportion to the length of the lever, and the weight attached to it. Thus I establish the first part of my invention, making the action so far self-acting as I only require a power to lift the said lever and weight, to keep the blocks off the wheels; and if that power is not applied, the blocks will be forced against the wheels, and kept there by the power of the said lever and weight until released by some acting agent.

I will now describe my method of raising the said lever; and it will be perceived, by reference to the accompanying sheet of drawings, that, instead of the weight already named, I use a conical spiral spring or springs, enclosed in a cylinder for the same purpose; and, as it is evident

that either means will answer the same ends, I will only explain the method of working the lever by the power of the spring. I attach to the end of the said lever a vertical rod, extending about half way up the end of the carriage, where I fix to the end of the carriage a cylinder containing one or more conical springs, to which I attach the said vertical rods. At the bottom of the said cylinder, and under the spring or springs, I place a small cross pin or bar, with projecting arms, to slide in grooves in the cylinder, so that, as the small cross bar is drawn upwards, the spring or springs are compressed, and the vertical rod, thus drawn up, lifts the aforesaid lever and draws off the blocks from the wheels; but when the said spring or springs are not compressed, it or they exert their force against the lever, and force the blocks against the wheels, exerting a power similar to the weight aforesaid. To give the guard or person in charge of the breaks the necessary power or control over this apparatus, I attach another vertical rod to the said projecting arms of the small cross bar, and continue it to the top or roof of the carriage; to the top end of this vertical rod I attach a double rack and wheel, so that when the man in charge turns the wheel he raises the rack, and consequently the vertical rod attached to the projecting arms of the cross bar, thus compressing the spring or springs and raising the lever, as already described. I also fix a simple ratchet and catch, to keep or hold the rack and rod in their positions when raised to keep the blocks off the wheels; by releasing the ratchet and catch, the rack, vertical rod, and lever, fall, and complete the self-acting motion aforesaid. I use a double rack, as already mentioned, for the purpose of reversing the action when the carriage is turned or its position reversed. I have shown this apparatus or double rack as being worked by a wheel and pinion, but I claim to work the same power and motion by a screw, a lever, or other similar mechanical power.

I will now explain my method of forming or completing a continuous connexion of the said power or apparatus, so as to act upon a number of carriages simultaneously. I place a horizontal shaft, either tubular or solid, along the top of each carriage, to revolve in steps or bearings, lined with vulcanized india-rubber or some similar soft elastic material, one end of the said shaft passing through the wheel which acts upon the double rack already described, so that, when the said wheel is turned, it both raises the

rack and turns, or partially turns, the said horizontal at the same time. About the middle of each of the shafts I make a square expanding slide or socket, so as the train elongates or contracts by the action o buffer rods, the shafts will accommodate themselves t varying distances between each carriage; and in orde the said connecting shafts may also accommodate t selves to the different heights of carriages and to give when the train is travelling on curves, I make that p the shaft which projects over or beyond the ends of the riage with strong flexible universal joints, so that this of the horizontal connecting shaft may either hang over the end of the carriage, or be slidden back out o way, when not connected to the shaft of another car These peculiar joints are commonly known as ball socket joints; but, instead of the usual loose ball socket, I bolt them through at right angles, so that will give way in every direction, and accommodate t selves to the necessary requirements, as already stated. order to connect these flexible parts of the connecting with ease and the necessary safety, I use reversing cou with spring catches and safety screws, so that the conn is instantly made by inserting the end of the shaft int socket of the coupler, and by its reversing motion l insert it into the socket of another coupler, thus for the connexion in any position of the carriages. I represented the connecting shafts as placed along the of the carriages, but it is evident that I can work either at the sides, underneath, inside the carriages or or, in fact, in any convenient position, as it is only n sary for the man in charge of the breaks to turn, or tially turn, one end of the connecting shaft; and, by m of the connexions already described, he will give moti all the shafts at the same time; and by raising all the and compressing all the springs by the same power or trivance, he will lift all the levers, and thus detach al breaks; and by dropping the catch into the ratchet-w they will be held in that position; and by releasing said ratchet and catch, all the break blocks will be ap to the wheels instantly. I also fix this apparatus or tender, so that it may be worked by the engine-drive stoker, and apply it to waggons or luggage trains, as as carriages. It will also be clearly understood by person conversant with practical mechanism, that this

tinuous connexion may be applied to work a signal between one part of a train and another, by causing it to strike a bell, sound a whistle, shut off the steam, or to work any other contrivance for effecting the said object of giving a signal when necessary.

Having thus described the general nature of my said invention, I will now describe it in detail, by reference to the accompanying sheet of drawings, in which the same letters of reference are used to represent similar parts when different views or diagrams are shown.

Fig. 1, is a side elevation of a railway carriage, showing my connecting shaft, with the apparatus in gear, and consequently the break blocks off the wheels.

Fig. 2, an end elevation of the same, showing the action of the spring, and the connexions of the vertical rod with the horizontal shaft; and

Fig. 3, a plan thereof. A, represents the lever acting on the centre shaft of the break, and applying the four blocks to the wheels; B, B, the pipe nuts for adjusting the blocks to the wheels; C, the cylinder containing the spiral spring; D, the double rack, with connecting links acting on the lever; E, the cross pin which acts on the spiral spring; F, a wheel and pinion for raising the rack and compressing the spring or springs; G, the horizontal shaft, with expanding slide about the centre; H, the flexible points; and I, the reversing coupler, with spring catch and safety screw.

Having thus fully described the nature and particulars of my said invention, I desire it to be distinctly understood, that I do not confine myself to the exact details herein set forth, as such may be varied or modified without departing from the principle thereof;

But I claim as new, and which, to the best of my knowledge and belief, has not been hitherto used within this realm, firstly, the method of working the breaks of carriages, whether the same be on railways or common roads, and of making them partially self-acting, by the power of a conical spiral spring or springs, or weight or weights, acting on a vertical rod or rods, and communicating with a lever acting on the centre shaft of the break; and, secondly, the method of connecting two or more of such apparatuses together, by means of horizontal shafts along each carriage, with expanding slides, flexible joints, revers-

ing couplers with spring catches and safety screws, as herein described and illustrated.—In witness, &c.

JAMES NEWALL.

Specification of the Patent granted to WILLIAM HENRY FOX TALBOT, *of Lacock Abbey, in the County of Wilts, for Improvements in Obtaining Motive Power.*—Dated December 13, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention is a new kind of electro-magnetic machine, which may be briefly thus described:—A heavy iron cylinder is made to roll upon a long but narrow metallic table or plate, close beneath which a long row of horse-shoe electro-magnets is placed. These magnets stand vertically with their poles uppermost, so that, as the cylinder rolls along the plate, it unites the two poles of each magnet consecutively. If the magnets are placed close enough together, and on a level with each other, their summits will form a sufficiently firm surface for the purpose required. The machine is so contrived that the cylinder is always attracted forwards till it reaches the end of the row of magnets; the action is then reversed, and it returns in the opposite direction till it reaches the other end, and so on. The whole distance traversed by the moving cylinder makes one stroke of the engine. The cylinder communicates its force and motion to the rest of the machinery, by its axis being attached to a crank and fly-wheel. The motion of the cylinder itself sets in action the contrivance (sometimes called a commutator, sometimes a rheotome) which magnetizes the magnets that are before the cylinder, and non-magnetizes those behind it.

Having thus given a general description of my invention in my preliminary specification, I now proceed to describe it more particularly:—A, fig. 1, is a rectangular horizontal plate of metal or table of wood, whose length considerably exceeds its breadth. B, is a hollow iron cylinder, which rolls along the middle of the table backwards and forwards, from end to end, being retained in its true path by proper guides. C, C, is the axis of this cylinder, the two ends of

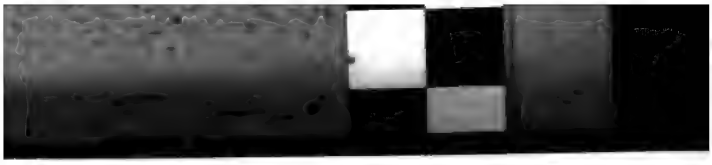
which unite with a crank rod, R, of considerable length, connected with a crank on the axis of a vertical fly-wheel, whose plane is parallel to the longer side of the table. Now, supposing the fly-wheel to be moved by hand, its revolution will draw the cylinder backward and forward from end to end of the table, supposing the crank sufficiently long and adapted to this purpose. But if, on the contrary, the motive power resides in the cylinder, as it does in this engine, then the motion of the cylinder from end to end of the table will cause the fly-wheel to revolve.

The motion of the cylinder is effected as follows:—A number of equal and similar horse-shoe electro-magnets are placed vertically beneath the table and let into it, so that their poles or ends are brought level with the upper surface of the table. Their north poles, N^1, N^2, N^3, &c., form a row on one side, and their south poles, s^1, s^2, s^3, &c., form a row on the other side of the middle of the table, fig. 1. As the cylinder rolls on the table, it first comes into contact with the two poles, N^1, s^1, of the first electro-magnet; then quitting these, it comes into contact with the two poles, N^2, s^2, of the second electro-magnet, and so on. These being electro-magnets, and not permanent magnets, the attraction which may be exerted by them on the cylinder depends entirely on the action of the commutator, which term I employ to denote the contrivance or instrument employed to change the direction of the galvanic currents. Now the commutator of this engine is so contrived that the cylinder is not attracted by the poles of the magnet with which it is actually in contact, but by the poles of the next magnet. Suppose, for instance, that the cylinder is actually in contact with N^2, s^2, the poles of the second magnet; at that moment the commutator has magnetized the third magnet, leaving the second one inert, consequently the cylinder moves on towards the third magnet, and so on till it reaches the end of the row of magnets and begins to return. If the same commutator were now to remain in use, it would check and retard the motion of the cylinder. A different one is therefore employed during the return of the cylinder, which always magnetizes the magnet next to the cylinder, but on the other side of it to what was done previously. Hence it is evident that in describing the mode of action of this engine, the attention must chiefly be fixed upon the construction of the commutators, which have to perform these complicated alterations of the galvanic currents. In

order therefore to explain the action of the commutato will suppose the table, A, fig. 1, to be surrounded o sides by a broad horizontal margin of wood, M, N, O, a shall divide the description of the mechanism employe change the galvanic currents into several parts, viz., polar connecting piece, the electrodes and their ends helix ends, and the two travelling commutators. A gal battery of any common construction may be employed; wires proceeding from the two ends of the battery ar into a thin rectangular tablet of wood, T, fig. 2, and te nate in two broad metallic discs, D, D', separated from other by the wood. These discs are on a level with lower surface of the tablet, T, which I call the polar necting piece. The wooden margin, M, on the left sid the table, has let into it, level with its surface, two strips of metal, U, U', which I call the left hand electr These, when they reach the end of the margin at M', bent below it, which is expressed in the figure by d lines, and brought up again at the front part, O, of margin, where they terminate in two round metallic d E, E', level with the surface, O. Similarly the margin, N the right side of the table, has let into it, level wit surface, two strips of metal, V, V', which I call the hand electrodes. These, when they reach the end of margin at N', are bent below it and brought up again a front part, O, of the margin, where they terminate in round metallic discs, F, F', level with the surface, O, placed parallel to the discs, E, E', but at the distance of or two inches from them. The discs, E, E', are as far a from each other as the discs, F, F', and also as the d D, D', in fig. 2. Care must be taken that none of electrodes touch each other in any part. The battery b placed at any convenient distance, the polar connec piece, T, which I have described, is placed on the front O, of the margin of the table in such way that its d O, D', fall on the discs, E, E'. Consequently metallic co is established, and the metallic strips on the left side of table become, in fact, as I have named them, electrod the battery, or terminations of its wires. The connec piece, T, has its surface always in contact with that of margin, O, but is capable of being moved backward forward in a straight line, being retained in its pat guide pieces of wood at its sides. When it is pu forward, its discs, D, D', quit contact with the discs,

and come into contact with the discs, F, F', by which means the metallic strips on the right side of the table become the acting electrodes of the battery, those on the left side at the same time ceasing to be so. This shifting of the connecting piece, T, from one position to the other occurs once in each stroke of the engine, and that not gradually, but rather suddenly, which is accomplished by the following simple contrivance: — the connecting piece, T, has a knob or button, X, on it, and the axis of the cylinder carries a long wire, W, parallel in its direction to the stroke of the engine, and having on it two lateral hooks, Z, Z', nearly as far apart as the length of the engine stroke. When the cylinder has nearly reached the end of its excursion in one direction, one of these hooks catches against the button, X, on the tablet, T, and pushes it from one of its situations to the other, and leaves it there. The button lying between the hooks is not affected by the motion of the wire until the cylinder has nearly reached the opposite extremity of its excursion, when the other hook, Z', catches against the button, and pushes the tablet back into its first situation. Thus, nearly at the end of each stroke of the engine the position of the tablet is rather suddenly altered, and thereby one set of electrodes are thrown out of action, and the other set are thrown into action. I now come to describe the arrangement of what I call the helix ends. Each electro-magnet is surrounded by a helix of copper wire, in the usual way. Let the two ends of this wire be called P and Q. The wire, P, is bifurcated, or divided into two parts, of which one goes to the left side, the other to the right side of the table, and each terminates in a metallic disc, P and P', in the wooden margin of the table. The surface of these discs is level with the surface of the wooden margin. Similarly the wire, Q, is divided into two parts, one of which goes to the left side, the other to the right side of the table, and each terminates in a metallic disc, Q and Q'. The disks, P and Q, are placed beside each other, but care must be taken that they do not touch, and likewise that none of the helix wires touch each other, or touch the electrodes. All must be insulated from each other by the interposition of wood, or otherwise. Similarly the discs, P' and Q', are placed beside each other. The same arrangement is effected for each of the other magnets.

The result is, that between the two strips of metal, which I have called the electrodes, on the left side of the table, there is a double row of metallic discs, viz., P, P, P, &c.,



Q, Q, Q, &c.; and that similarly, between the two elect
on the right side of the table, there is a double row of
viz., P', P', P', &c., Q', Q', Q', &c. I come now to descril
two travelling commutators. Each of these being sim
will be sufficient to describe one of them. The axis
cylinder carries an arm oblique to the horizon, and
enough to reach the margin of the table. This arn
minates in a small wooden tablet, G, fig. 3, which is p
flat down on the surface of the margin of the table by
of a spring; and since the motion of the axis of the cy
is parallel to the surface of the table, the commutator t
backward and forward upon the margin of the table
tinually touching its surface. The construction of the
mutator will be understood from figure 3, where G
commutator, made of wood; H, I, are two pieces of
let into it, level with its lower surface, and insulated
each other by wood. In order to understand its act
must recall what has been said before, confining my
tion, at present, exclusively to the left side of the
The table margin, M, figure 1, contains two metallic
or electrodes, U, U', and between them two rows of
discs, P, P, P, and Q, Q, Q.

Now, suppose the galvanic battery to be in action
that the polar connecting piece, T, is in such a situatio
these electrodes are in connexion with the battery.
since there is as yet no connexion between the electrod
the electro-magnets, none of them are magnetized.
let the commutator be placed upon the margin, in
with any two of the discs, P and Q. I have explainec
the commutator contains two metallic pieces, H and I (
3). Of these the piece, H, falls partly upon one
electrodes, U, and partly on the disk, P, bringing then
metallic connexion, while the other piece, I, falls
upon the other electrode, U', and partly upon the di
bringing them into metallic connexion. The conseq
of this is, that the electro-magnet, corresponding to P
is magnetized. In order to see this, it will be sufficie
trace the course of the galvanic current. Issuing fro
end of the battery it passes through the disc, D', in the
connecting piece, T, figure 2; thence into the dis
figure 1, which is the end of the electrode, U, then th
that electrode, and through the metallic piece, H, in the
mutator, it enters the disc, P, which is the end of the
surrounding one of the magnets. It then traverse

whole of that helix, and comes out at its other end, viz., the disc, Q. From thence it enters the other metallic piece, I, in the commutator, and from thence it enters the other electrode, U^1, which ends in the metallic disc, E. From thence it enters the disc, D, in the polar connecting piece, T, figure 2, which conducts it to the other end of the battery. Therefore the galvanic current is complete, and therefore the electro-magnet is magnetized. I have explained that the arm carrying the commutator has a certain obliquity, this is in order that it may not magnetize the magnet with the poles of which the cylinder is actually in contact, but the one next in order. The cylinder, under the influence of this attraction, moves onward to the attracting magnet, of course carrying with it the commutator, which is attached to its axis. This movement unmagnetizes the electro-magnet and magnetizes the next one, and so on. Now let us turn our attention to the other commutator, which is fastened to the axis of the cylinder, on the right side of the table. The only difference is, that a different obliquity is given to the arm carrying the commutator, so that, instead of acting upon the magnet immediately preceding the cylinder, it acts on the one immediately behind it. But this position, which is behind the cylinder, as it moves in one direction, is, of course, before it as it returns the other way; so that, in fact, this second commutator acts in a similar way to the first, urging the cylinder onward in the direction in which it is going at the time. It is necessary to recollect that the two commutators do not act at the same time, but that the electrodes and the helix-ends and the commutator on the left side of the table, which are employed during one stroke of the engine, are all thrown out of action during the return stroke, and those on the right side of the table are then brought into action. The iron cylinder employed should be of considerable diameter, for example, twelve or fifteen inches. Supposing the magnets to be placed at a distance of two or three inches apart, and the cylinder to be in contact with the poles of one of them, its surface should not be elevated much more than a quarter of an inch from the poles of the next magnet, which requires that its diameter should be large. The length of the stroke of the engine depends on the number of electro-magnets, which are placed in a row beneath the table, and is therefore capable of being augmented, *ad libitum*, as far as convenience may permit.

Having thus described the mechanism, it only remains to

explain that the cylinder being urged by magnetic power from end to end of the table, communicates its motion to the crank and fly-wheel. The things claimed as new in this invention are, the general construction and arrangement of the engine; more particularly the mode in which the cylinder is urged from end to end of the line of electro-magnets; together with the large size of the cylinder, which causes its surface to be near the surface of two or three of the electro-magnets at the same time; and the peculiar construction of the commutators, and other mechanism for changing the direction of the galvanic currents.—In witness, &c.

WILLIAM HENRY FOX TALBOT.

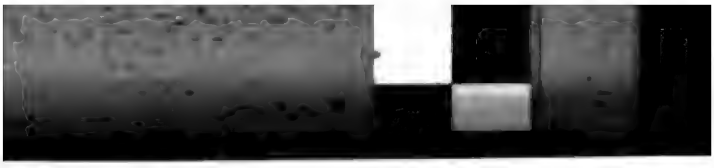
Specification of the Patent granted to RICHARD MOUNTFORD DEELEY, *of Audnam Bank, in the County of Stafford, Glass Manufacturer, for Improvements in the Grates of Furnaces used in the Manufacture of Glass.*—Dated January 20, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My said invention consists in improving the construction of glass-furnace grates by the erection of grates formed and disposed in such manner, as that while the advantage of burning small fuel or slack is retained, the advantage is gained of having a greater draught and greater heat. Formerly the grates of furnaces for smelting glass were formed of horizontal bars, placed generally in the middle of the furnace, extending through the whole length of the furnace, or only part thereof, as the case might be; but in which case the draught having no other inlet into the furnace, combustion was slowly performed; the bars too were soon choked up, and none but large coal could be beneficially used therein. Now I design to construct the grates so that a current of air may be admitted to the fire not only from the under part of the grate but from its ends or sides, or both; which may be effected by having the grate to hang lower than the seige and forming the ends and sides of the grate (which are so below the seige) of bars of iron or other sufficient metal, or perforated plate of iron or other suffi-

cient metal; or in lieu of such bars or perforated plates, or in addition thereto, perforated brickwork may be used; or the seige or bed of the furnace may be perforated as shown in figs. 1, 2, 3, and 4, of the sheet of drawings hereunto annexed. I do not confine myself to the shape of the grate, as various designs of grates may be used, so that the advantage of lateral draught be retained; as, for instance, what I term a step furnace may be used as shown in figs. 1 and 2, and which may be formed of bars or perforated plates; and the invention is applicable to various shapes of furnaces, such as round, oval, square, and other shaped furnaces, but the grates used in round, oval, octagonal, or other such like furnaces would be better placed in the centre of such furnaces, and such grates may be of the like description with that shown at fig. 5; and here the bars, as shown in fig. 6, may be either inclined or vertical, as hereinafter mentioned; a furnace grate formed, as shown at fig. 7, in a semi-oval or semicircular shape may be used. The perforation of the seige or brickwork hereinbefore mentioned at the sides of the grate may be used in conjunction and combination with such hanging or side bars, or it may be used also where the fire-grate is made of a circular, oval, or other similar form; but in order the better to explain in what my invention really consists, I will proceed to describe the drawings hereunto annexed.

Fig. 1, is a sectional view of a four pot bottle (square) furnace showing the step grate with the side bars and perforated brickwork; *a*, *a*, *a*, *a*, *a*, are the bars forming the bottom portion of the grate, which bars rest upon or are supported by sleepers or cross bars, *b*, *b*, *b*, *b*, *b*, *b*, *b*, *b*, *b*, *b*, which may be built in or supported in the brickwork of the cave; that portion of these bars which is marked, *c*, *c*, *c*, *c*, and is shown in the drawing as placed in a vertical position and which forms the step of the grate, may be either formed of the same pieces of iron as the bars, *a*, *a*, *a*, *a*, *a*, by having such bars bent into a rectangular position; or, if preferred, the portions of the bars marked, *c*, *c*, *c*, *c*, may be inclined to such degree of inclination as may suit the manufacturer; or these several sets of bars may be inclined, and various relative inclined or horizontal bars may be used; or this portion of the grate forming the step, instead of being formed out of the same piece of iron as the bars marked, *a*, *a*, *a*, *a*, *a*, may be formed of separate pieces of iron, but this is attended with far greater expense, as they would



have to be suspended from cross bars, or otherwise ke
their proper positions. We do not confine ourselves t
length which these bars bear in relation to the bars, *a*,
a, *a*, as they may be longer or shorter to suit the v
of the manufacturer; and if shorter it may throw the
a, *a*, *a*, *a*, *a*, to an incline, which is advantageous: or i
bars, *a*, *a*, *a*, *a*, *a*, are required to be inclined, and one
of them lifted up to meet the end of the next set of bars
bars, *c*, *c*, *c*, *c*, may be dispensed with, in which case a s
space, say of from one to two, or four inches, woul
left between the sets of bars respectively marked, *a*, *a*,
a; c^1, c^1, c^1, are the side bars of the grate, which side
may be placed in a perfectly upright position or
be inclined so as to form either a slight acute or ob
angle with the lower bars, *a*, *a*, *a*, *a*, *a*. The bars c^1, *c*
may be supported in any of the known modes of suppo
bars similarly placed. d^1, d^1, d^1, d^1, d^1, d^1, show the
forations or holes in the seige or brickwork forming
bed or under portion of the furnace, these perforat
or holes are carried through the brickwork so that an o
for draught may be obtained, but we prefer simply to c
these holes or perforations through the brickwork into
cave, although it is obvious that it is immaterial where
outlet is carried, so that a draught be obtained, this n
of perforating the seige or brickwork below the floor of
furnace is altogether new, and gives the great advan
of producing additional draught, and it may be used in c
bination with the other descriptions of furnaces herein
mentioned, and also in combination with the old gr
formed of horizontal bars; or, in fact, with every descrip
of grates used in glass furnaces; and if properly so c
bined, great advantage will be derived from the use of
perforations, as it will greatly increase the draught w
is highly desirable, and it is obvious that a greater or
number of such perforations may be made in the brick
of each side of the furnace as they may be found needfu
creating draught, and such perforations or holes may be n
larger or smaller as may be required, but they should b
constructed that the workman may be able easily to c
them out and clear them from all obstructions; and dam
may be fixed on the openings of the holes in the cave
wherever else the outlet for draught may be fixed for
purpose of regulating the amount of draught to be admi
through these perforations to the furnace, the mod

applying such dampers, and the nature of, or description of the dampers is so well known as not to need description, as anything which may act as a stop to the draught, removeable at pleasure will be sufficient for the purposes; and, if preferred, these openings, perforations, or holes, may be formed of iron or other sufficient metal work or otherwise, and made square, oblong, or of any other forms, or may be formed of tubes, it being immaterial how or in what manner they are formed so that the holes, perforations, or openings are made in the seige or brickwork as above mentioned for the purpose of increasing the draught; *e*, *e*, is the cave of the furnace; *f*, *f*, the seige or bed of the furnace; *g*, *g*, are the teeze holes through which the fuel is passed to the fire; *h*, *h*, are the pots in which the metal is placed; *i*, *i*, are the working holes through which the metal is worked from the pots; *j*, *j*, are the walls of the furnace; *k*, is the crown of the furnace; *l*, tunnel hole from the furnace; *m*, the tunnel; *n*, *n*, the floor of the glass house. As to what we have hereinbefore described, we only claim as new and part of our invention the grate formed of bars as hereinbefore described, and also the perforated brickwork as hereinbefore described.

Fig. 2, is a plan of the same furnace with the step grate and perforated brickwork combined.

Fig. 3, is a sectional view of a similar furnace to the one above described, showing another portion of our invention for obtaining better draught, which consists of a grate having its lower bars horizontal with the side and end bars placed either vertically or slightly inclined either way, so as to form either an obtuse or acute angle respectively with the lower or horizontal bars. If preferred, the lower or horizontal bars may be placed so as to form a slight double incline, but the object of this description of grate is by having the side and end bars placed as described, to get the action of the air upon the sides and ends of the fire at once so as to obtain a greater degree of combustion, thereby obtaining a greater degree of heat, and it also enables the manufacturer to burn an inferior description of fuel. In this figure the perforated brickwork is also shown.

Fig. 4, is a sectional end view of the furnace lastly hereinbefore mentioned, showing the end bars of the grate lastly described, and also showing the perforations in the brickwork.

Fig. 5, is a plan of a round grate, more particularly

adapted for use in flint-glass furnaces, which are in general round. I prefer to have the lower bars of this grate placed horizontally, and the upper parts forming the round I prefer to have placed in an inclined position, as shown in drawing, although they may be placed vertically, my object being, as before mentioned, to improve the combustion by admitting the air to act all round the grate. It is obvious that by altering the form of the supporting bars or other supports by which such grate is sustained or upheld, a different form of grate may be obtained, as instead of a round grate an oval, or sexagonal, or other similar shaped grate may be formed, but the exact shape is immaterial so long as the desired objects be effected. The upper bars may be supported in their places by having a circular bar of iron or sleeper passing around on the outside, as shown in fig. 6, the upper portion of such bars being bent so as to rest upon such sleeper, as shown in fig. 6, where *a* is the upper portion of the bar, bent as above mentioned, and resting upon the sleepers or bars, *b*, *b*; *c*, *c*, *c*, are the sleepers which support the lower bars of the grate.

Fig. 7, shows a variation in form of the grate, having the lower bars to form a semicircle or nearly so instead of having inclined bars or upright bars in combination with the lower bars. It is obvious that grates of various forms or shapes may be used so that the air may be admitted to act all around the sides and ends of the fire, or all around as the case may be for the purposes aforesaid.

Having now described the nature of my invention, and in what manner the same is to be performed, I would have it distinctly understood that I do not claim the parts of the furnace separately.

But what I do claim as my improvements in the grates of furnaces used in the manufacture of glass, is the erection of grates as herein before described for glasshouse furnaces, whereby the air, having a greater space to act upon the fire, increases the combustion and produces a greater heat. And also the erection of glasshouse furnace grates with perforated brickwork as hereinbefore described.—In witness, &c.

RICHARD MOUNTFORD DEELEY.

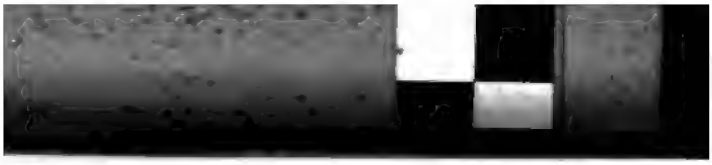
Specification of the Patent granted to JOSEPH TRINGHAM POWELL, *of No. 28, Fenchurch-street, in the City of London, for Improvements in Mixing, Baking, and Drying Materials in the Making of Biscuits, and other articles where plastic matters are employed.* — Dated November 10, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.— The principal object of this invention is to arrange machinery to mix flour and other matters into dough, to convert it into sheets or forms suitable for the object, to cut and carry the same to an oven to bake, and then to dry the biscuits so formed, thus avoiding handling from the commencement to the end of the process. The principle of the machinery, however, is applicable when preparing other materials into a plastic state, and forming and drying articles made thereof. And in order that my said invention may be most fully understood, I will proceed to describe the means pursued by me.

Description of the Drawing,

which shows machinery and apparatus combined, according to my invention, and suitable for making biscuits, or, it may be, other articles; and according thereto the materials employed are first mixed by a suitable machine, and are delivered in the mixed state to an endless web, which carries the dough to rollers, where it is pressed and polished on one side; thence the sheet of dough passes between a second pair of rollers, where it is polished on the other side. The sheet of dough is then cut into biscuits by ordinary machinery, and the same are received on to another endless web, which conveys them to the oven, where they are received on to trays, and by the trays they are moved through the oven, where they are baked and dried, and are then delivered from the trays through an opening out of the oven. And it is the arranging or combining apparatus in such manner as to carry on these processes in succession without handling the biscuits or articles produced, which constitutes the peculiarity of the invention. I would



state that the construction of the machinery may be without departing from my invention.

Fig. 1, is an oven of the form I prefer to use; t employed by me is thirty-five feet high. Within th endless chains, A, A, work, which carry numerous tr say, one to each link, though only a few are shown drawing; C, is the shaft, which gives motion to the A; and in order to keep the chains correct, the axes lower pulleys are carried by levers or arms, D, as This oven I prefer to be heated by anthracite coal, does not give off products prejudicial to the proces the heat and products of combustion from an ant fire come in at the opening at F, and the oven i said to be the vent or chimney to the fire. In or regulate the draught through the oven, I apply a regulator or valve, G, with slits or openings thro there being similar openings through the top of the E, is a bar of iron fixed within the oven at E^1, as its upper end passes out of the oven and is connecte pin-joint to the ball-crank, E^2, which moves on an E^3, the other end of the crank being attached by a pi to the valve, G; hence, as the rod expands in leng valve is more and more closed, and the draught th the oven reduced, which acts as a damper to the fire oven is getting too hot, and, on the other hand, the c tion of the bar will cause the ventilator to be more c and consequently induce a greater draught and mor from the fire. The trays as they come opposite th or passage, H, shoot off their contents, which slide th the opening, H, into a suitable receiver (outside oven) in a baked and dry state.

Fig. 2, shows the mixing apparatus, which consists cylinder, I, with an opening at J, through which the or mixed materials pass in a thicker or thinner according as the moveable flap, K, is pressed, and he or more down by the lever-arm, K^1. This machine is what like a pug-mill, it having inclined blades, L^1, axis, L, which receives rotatory motion from a steam- or other power; M, is a fixed partition, having op near the centre for the passage of the materials process of mixing; and on this partition are fixed i inclined blades, M^1. On the axis, L, is fixed the sti with blades, N^1, which act between the blades, M^1

materials are supplied by a hopper, and are mixed and driven out of the machine in a sheet, as before stated. This sheet of dough is received by the endless web, O, and conveyed to the rolling and cutting apparatus.

Fig. 3, which are well known, and are those in common use, and separately, are not claimed as of my invention. The first pair of rollers, P, rotate by being geared together, the upper one, however, moving with greater surface-speed than the other. The dough then passes to the second pair of rollers, Q, there being a supporting-plate or surface for the dough between the two pairs of rollers, P, Q. In the second pair of rollers, Q, the lower roller has the greatest surface-speed. The sheet of dough is then cut by the cutter cylinder, R, as is well understood, and the sheet of biscuits is received on to the endless web, S, and by it they are delivered on to the succeeding trays, through the opening, T.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is, the mode herein described of combining machinery and apparatus for mixing, baking, and drying materials in the making of biscuits and other articles.—In witness, &c.

JOSEPH TRINGHAM POWELL.

Specification of the Patent granted to ANDREW ROBESON, *junior, of Newport, in the State of Rhode Island and United States of America, for an Improved mode of Bucking or Bowking Cloth.*—Dated November 8, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Of the said drawings, figure 1 exhibits a side elevation; figure 2, an end elevation; figure 3, a vertical, central, and transverse section; figure 4, a top view; and figure 5, a central and longitudinal section of the apparatus used in bowking cloth, by my said invention.

In the said drawings, A, denotes a closed vessel or kier, made of copper, or other suitable material, and divided into two chambers, B, C, by means of a grating or perforated par-

tition. D, E, is a forcing pump, whose induction pipe is seen at F, as connected with an opening out of the lower part of the chamber, C. The eduction pipe of the said forcing pump is seen at G, and as passing out of the top of the forcing pump, or the upper valve chamber, H, thereof, through the side of the chamber, C, and up through the middle of the chamber, B, and near the top of the same, where it is surmounted by a meniscus-shaped deflector; K, L, and M, are the valves of the forcing-pump; N, its piston; and O, its piston-rod, which is worked up and down by means of an eccentric, P, fixed upon the shaft, Q. Into the upper part of the vessel, A, a steam-pipe, R, is led; the said steam-pipe being made to communicate with a steam-generator, or boiler. The said steam-pipe is provided with a safety-valve, S, and a stop-cock, T; a small pipe, U, is also carried down through the middle of the vessel, A, from or near the top of the pipe, G, and terminates at its bottom, just below the grating, D, and has a small safety or weighted-valve, V, fixed upon its lower end.

In the use of the above-described apparatus, the goods to be bowked, or bucked, are laid within the chamber, B, of the kier, A, and around the pipes, G and U, the said chamber, B, being packed with the goods nearly up to the level of the top of the pipe, U. The scouring or bowking liquor is placed in the chamber, C, and such chamber is to be heated, or not, as occasion may require, by heat applied to its external surface.

The force-pump being set in operation, the hot liquor from the chamber, C, will be drawn out of the lower part thereof, and forced up through the pipe, G, against the deflector, K, by which it will be distributed upon the top surface of the cloth.

Now if steam is let into the chamber, B, through the pipe, R, it will press closely upon the cloth and bowking liquor thrown upon it, and will aid in causing a rapid filtration of the bowking liquor through the goods, or cloth, and into the chamber, C. The bowking liquor thus not only descends by the power of gravity, as it does in the common process of using a kier, but it is forced downwards and through the cloth by the superincumbent pressure of the steam. If the pressure of the steam at any time exceeds the maximum pressure required for the operation of the kier, the safety-valve, V, weighted to such maximum pressure, will be forced open, or raised, and allow the steam to escape into

the chamber, C, where it will be condensed in the bowking liquor. A pipe for the discharge of the contents of the vessel, C, may be led out of the bottom of the said vessel, and be provided with a stop-cock, and the vessel, A, may have an opening *a*, through its top, and a cover, *b*, to the said opening, as seen in the drawings; the said cover being provided with suitable contrivances, by which it may be readily fixed on, or removed from the opening, as occasion may require. The said opening, *a*, is intended for both the supplying of the goods and bowking liquor to the kier, or the removal of the goods therefrom.

I am aware that a kier has been constructed of two chambers, and that a *lifting* pump has been applied to the lower one, to raise the bowking liquor from the lower chamber, and discharge it into the upper one, and on the top of the goods, the upper chamber being an open chamber, open at its top. Now the lower chamber being heated, the steam arising from the bowking liquor in it is suffered to pass through a grating (dividing the two chambers), and upwards through the goods, or cloth. In this case the passage of the steam upwards through the cloth opposes and prevents, to a considerable extent, the infiltration of the bowking liquor.

I am also aware that a closed vessel, or kier, has been used, and made with two apartments, divided by a grating essentially, as represented in the accompanying drawings. Also, that a pipe has been led from the middle of the grating, and out of the lower chamber, and up through the upper chamber, and provided with a deflector on its top. In this case, heat being applied to the lowermost vessel, steam was made to ascend from the bowking liquor therein, and not only pass up through the grating and goods, but through the pipe and upon the top of the goods. In this last apparatus, there being the same pressure of steam below the goods as there is above them, the filtration of the liquor through the goods derives little or no assistance from the pressure of the steam.

I am also aware that an open kier has been made with two chambers, and a central vomiting pipe covered by a deflector, and that a steam pipe has been led into the lower chamber to discharge steam into and heat the bowking liquor used therein, and that while the central pipe extended down some distance, the pressure of steam in the upper part of said chamber would force the bowking liquor

upwards through the vomiting pipe and upon the top of the goods, so that such liquor would descend through the goods, and pass into the lower chamber of the two chambers and through the grating which separated the two chambers. In this last instance the upward pressure of the steam against this lower part of the cloth or goods is opposed to the downward filtration of the bowking liquor.

In my improved method of bowking, the pressure of the steam is not only employed to saturate the goods, but to assist and increase the filtration of the bowking liquor through them. The experiments I have performed have led me to discover, by the use of my apparatus, a very great saving of time and labour in the bowking of cloth; I am led to believe that there will be not only a saving of at least fifty per cent. in time, but there will be a great saving in full over the common processes of bowking.

What I claim as my invention or improvement is, the employment of a closed keir or vessel, as above described, and extracting the bowking liquor from the lower part of it, and forcing it into the upper part of it, in combination with injecting steam into the upper part of the said vessel, whereby the steam is made to press upon and pass into or through the goods or cloth, and not only facilitate the action of the bowking liquor, but assist the filtration or passage of the liquor through the cloth, all substantially as above stated.—In witness, &c.

ANDREW ROBESON.

Specification of the Patent granted to CHARLES WATT, *of Brompton, in the County of Middlesex, for Improvements in Obtaining Currents of Electricity.*—Dated November 23, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object two improvements in electrical apparatus.

First, improvements in galvanic batteries: which consist of combining different metals or substances in succession

in such manner that heat, such as that of steam heated or otherwise, or heated air, may be applied at one end or part, and cold (or lower temperature) by cold air or otherwise may be applied at the other end or part, thus dispensing with the fluids heretofore used, and avoiding the decomposition of metal consequent thereon. Such galvanic battery being amongst other uses peculiarly applicable in obtaining electro-magnets, and from such and other electro-magnets I obtain by the aid of the second part of my invention currents of magnetic electricity, by causing the armatures to have a compound movement applied thereto, consisting of a rotatory motion and a reciprocating motion. And in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the means pursued by me.

The two different metals I have used for the purpose are antimony and bismuth, but I do not confine myself thereto, as other matters may be similarly employed.

Description of the Drawing.

Fig. 1, shows an end view in section of a battery, constructed or combined according to my invention; and

Fig. 2, shows an edge view or plan of a series of plates combined together, end to end. The drawing shows the parts about half size, and I prefer to arrange or combine the plates in rows of about one hundred pairs in each row.

The drawing, fig. 1, shows seven rows, the electricity of each may be used for separate purposes, or they may be combined and used together for one purpose, according as quantity or intensity is desired. The plates, *a* and *b*, of the different metals used, I prefer (when the materials employed will admit of it) to be cast together at their ends, which is accomplished by casting one of the metals into plates, and then by placing them in suitable moulds to be cast thereon, similar plates of the other metal; and to facilitate this, the ends of the plates first cast are to be rendered perfectly clean and free from oxide or impurities, as is well understood, in order that the other metal when run thereon may adhere thereto; and to insure this result I have found it desirable to coat the clean surfaces with chloride of zinc, which will aid in getting the metals to adhere. *c*, *c*, are the sides of the apparatus; *d*, *d*, bottoms thereof; *e*, *e*, are two parts of two partitions connected

to the bottoms, *b*, *b*, and running from end to end apparatus.

The two ends of the apparatus are closed similarly two sides, *a*, *a*. On the upper edges of the two part *c*, *c*, are placed vulcanized india-rubber, *d*, *d*, then th bined series of plates, A, are placed thereon, as show in order to prevent the steam, heated air, or othe getting between the combined pairs of metals, the packings of vulcanized india-rubber applied, as is sh *e*, *e*. Two plates, c^1, c^1, are then fixed from end to the apparatus, vulcanized india-rubber being applied edges, as shown at *d*, *d*, when another row, B, of cor plates are to be placed in position, and then the plates, c^2, c^2, and then another row of plates, C, and till the whole number of rows to be employed are com as shown by the drawing. The apparatus, as sho arranged for using a constant supply of currents of c in one compartment, and steam or heated air in the by the pipes shown, but other fluids may be em The number of rows of plates may be varied, and th ber of pairs in each row, and the sizes and shapes plates, may be varied when using antimony and bi and arranged as above explained, and when at a temp at one end of about 400 degrees of Fahrenheit, and two degrees of Fahrenheit at the other, and arran intensity, I have found that ordinary binary comp such as chloride of sodium (common salt), may be posed by about ten rows.

I will now proceed to describe the second part invention.

Fig. 3, shows an apparatus suitable for carrying o part of my invention. *a*, is an axis turning in s bearings. *b*, *b*, which receives motion from any s first mover by an endless band acting on the pu On the axis, *a*, is a pulley, *d*, which, by means of an band, gives motion to a pulley fixed on the axis, *e*, turns in bearing at *f*, *f*, in which the axis, *e*, is also to slide to and fro, in order that the armatures, *g*, the end of the axis, *e*, which acts in front of an magnet (not shown in the drawing), which may be p by the battery above described, or by other form of *h*, *h*, are two rings or collars on the axis, *e*; and *i*, is with a forked end, partly embracing the axis, *e*, b

the collars, *h*, *h*. The lever, *i*, is caused to move to and fro by means of an eccentric, *j*, on the axis, *k*, which receives motion from the axis, *a*, by bevelled-toothed wheels, as shown. By this mode of working armatures, that is by giving them a compound motion of rotation and reciprocation, great advantage is derived, as the prejudicial effects consequent on residual magnetism are materially reduced, and actual contact between the armature and the magnet may with advantage be obtained.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is,

First, the mode herein described of combining parts into a galvanic battery; and

Secondly, I claim the giving to armatures of electro-magnets a rotatory and reciprocating motion.—In witness, &c.

CHARLES WATT.

Specification of the Patent granted to THOMAS BARNABAS DAFT, *of Lezange Lodge, Isle of Man, for Improvements in Inkstands.*—Dated June 3, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of combining with an ink-vessel or ink-holder a tube with a dipping cup at its upper end, there being a collar or stopper formed on the tube, which fits into an opening at the top of the ink-vessel. The tube descends from above, into and nearly to the bottom of the ink-vessel, through the opening; and by the compression of the air therein, the ink is forced into the dipping cup, and by raising the dipping cup the ink descends into the ink-vessel. The opening through which the tube passes is lined or formed with vulcanized india-rubber.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a plan of an inkstand.

Fig. 2, a section with the dipping-cup covered.

Fig. 3, shows a section with the dipping-cup uncovered.

Fig. 4, shows various views of the dipping-cup and cover separately.

Fig. 5, shows an elevation of the inkstand complete.

Fig. 6, shows a vertical section of the inkstand, the dipping cup being empty.

Fig. 7, shows a sectional view of the inkstand without the dipping-cup, but covered with the same cover as that shown in the other figures, as being applied to the dipping-cup; and

Fig. 8, shows the ink-vessel without cover or dipping-cup.

I would state that the form of the ink-vessel may be varied, and such is the case in regard to the other parts, so long as the mode of constructing the tube and the entrance into the ink-vessel be retained, whereby on the dipping-cup and its tube being introduced, the parts are rendered air-tight, and consequently, by the simple raising and depressing the dipping-cup, the ink will be caused to flow up to and sufficiently fill the dipping-cup. *a*, is the vessel for containing the ink, the form of which, as before stated, may be varied; at the mouth or entrance is fixed a ring of vulcanized india-rubber, but it might be gutta percha or other elastic and flexible fluid-tight matter, which forms, so to speak, a flexible and elastic lining, *b*, to the mouth of the ink-vessel. This, with the cover, *c*, are to be fixed air-tight on the top of the ink-vessel. *d*, is the dipping cup, and, *e*, the descending tube, which are similar to what have before been used, except that the collar or part where it fits into the ink-vessel, *a*, is made to correspond with the dimensions of the mouth of the vessel, *a*, and proper to fit therein air-tight, and yet admit of being moved up and down through such mouth-piece. *f*, is a moveable cover, which fits in the mouth of the vessel, *a*, when the dipping-cup is removed, and it is also suitable for covering the dipping-cup.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that what I claim is the combination of parts herein described.—In witness, &c.

THOMAS BARNABAS DAFT.

Specification of the Patent granted to GEORGE SANT, *late of Norton Lodge, but now of Keston, near Bromley, in the County of Kent, for Improvements in Clocks or Time-keepers.*—Dated May 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of applying to the pendulum an escapement wheel, which vibrates with the pendulum; and a tooth of the escapement wheel is allowed to escape each vibration by means of a fixed incline and a locking-pin. And, in order to give motion to the next, or minute wheel, the escapement wheel on the pendulum, by a projection, releases a detent and allows one tooth of the next, or minute wheel, to move every minute. At the same time the reaction of the detent keeps up the power to the pendulum, and from this wheel the other motions of the clock or time-keeper are derived.

Having thus stated the nature of my invention, I will proceed to describe the manner in which I perform the same.

The wheel A is furnished with sixty pins, as shown in fig. 1, two of which are introduced at B and C to show their action on D; and E F is the pendulum carrying the wheel G, of thirty pins, in front, and one, N, at back, and also the metal plate, D. H, is a locking-pin (a plan of this, with wheel, G, &c., is shown in fig. 2), made in one piece, and attached to a framework or case by I (the same parts in figs. 1 and 2 have the same letters). L, is a beam, carrying the steel-plate, E, on which each pin of the wheel, A, impinges and rests immediately after having given an impulse to the pendulum through D; this beam and the pendulum are both furnished with light springs, L^1, F^1, similar to those usually employed in the suspension of pendulums. A (assuming the pendulum to beat seconds), makes one revolution in an hour, and the wheel, G, one in a minute. The action is as follows:—the pendulum, F, which is drawn at the left-hand extremity of its arc of vibration, in its return swing, to the right, carries the pin, O, of the wheel, G, against and up the right incline of the locking-pin, H, the effect of which is the one-sixtieth of a revolution of the wheel, G, in the direction indicated by

an arrow, and the fall of the pin, N (driven into back thereof), into a line joining the axis of the wheel, G, with K. In this position, and just before the pendulum has completed its right oscillation, it will be carried against the head of K, which is a projecting pin, attached to L, and forcing it to the right, causes E, of the beam, L, to liberate the pin, B, of the wheel, A. At the time of this liberation (the pendulum being to the right, as described), D, the metal plate attached to pendulum, will be between the pins, C, and B, so that the pin, C (the wheel, A, being free to move in consequence of said liberation), falling on plate, D, will give to the pendulum, in its return swing to the left, an impulse in that direction, the impulse, of course, being given by and lasting during the passage of the pin, C, down the incline of the plate, D. It will be seen, on reference to the drawing, that the pin, N, leaves K, on return swing of pendulum to the left, in time to allow the plate, E (which, it will be remembered, it removed to liberate the pin it supports), to take the position shown before the pins of the wheel, A, leave the incline of D; in other words, E, returns to the position shown in drawing, before the pin immediately above it quits the metal plate, D; at every double vibration of the pendulum, the locking-pin, H, moves the wheel, G, through a one-thirtieth of a revolution; so that the pin, N, of wheel, G, in its next swing to the right with the pendulum, will be found to escape K, passing below it. And, travelling with the wheel, G, it will be seen that fifty-nine seconds, or vibrations, will transpire before the pin, N, is again thrown on K, and the series of movements above described repeated. P, carries the minute-hand. The hour-hand motion is got in the usual way. The drawing is made for a thirty-hour clock. The weight, W, hangs on an endless cord. To wind up the clock, the rope below the weight is held by one hand, while the weight, brought horizontally, is slid up the rope, and, when allowed to drop into its vertical position, the eye of the weight, through which the rope passes, will offer a sufficient bite to the rope to prevent its slipping or sliding thereon. By this arrangement all back or reverse action during the time of winding is prevented.

Fig. 3, shows a modification of the apparatus used for carrying out the invention. In this the beam, L, is made to carry both metal plates, D, and E, as well as the wheel, G. The locking-pin, H, is fixed to the pendulum, F. The pin, N, is driven into the same side of the wheel, G, as that on

which the thirty pins are fixed, with this exception, the wheels, G, are alike in both figures. When this pin, N, has travelled to that point lying in the path described by the locking-pin, H, H, in its swing to the left, impinges on it, when follow those actions with the wheel, A, and metal plates, D, and E; an explanation of which is hardly necessary after the observations already given respecting fig. 1. —In witness, &c.

GEORGE SANT.

Specification of the Patent granted to ALPHONSE RENE LE MIRE DE NORMANDY, *of Judd-street, in the County of Middlesex, for Improvements in Regulating the Pressure of Steam.*—Dated May 26, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of employing a valve apparatus between a steam boiler and a vessel or vessels, or chambers in which the steam is to be used at a lower pressure than that at which it is generated. The apparatus may be arranged in such manner that several processes, each requiring a different pressure of steam, may have the steam supplied from one and the same boiler. The valve in each apparatus is connected to a flexible surface of such dimensions, compared with the size of the valve (which closes the passage between the boiler and the apparatus where the steam is to be used) as will by the lesser pressure of the steam thereon, close the valve and prevent a further in-coming of steam from the boiler so long as the steam remains at the desired pressure; but so soon as the lesser pressure of steam on the larger area will not sustain the valve in its seat, a fresh influx of steam will be admitted and make up for the decreased pressure, and thus will be maintained a constant supply of steam at the pressure desired to each vessel or chamber where steam is used.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, is an elevation of the apparatus; A, a valve inter-

posed between the boiler and the apparatus where th
is to be used; B, a pipe in communication with th
in which the steam is at a higher pressure th
required for a particular purpose; B[1], is a small c
under the valve A; C, space over the valve in co
cation with the pipe H, and closed at the top by a c
of vulcanized india-rubber or other flexible substanc
to resist the lower pressure, screwed firmly and
place between the flanges, E and F; G, a lever
weight adjusted to the pressure required; H, a pipe
the steam from the boiler to the apparatus where it
required at a lower pressure; I, and I[1], nuts
which the india-rubber or flexible surface is screwe
shaft or shank of the valve. The action of the val
follows:—Suppose the steam in the boiler and pip
be at a higher pressure than is required in the pipe
the apparatus to which it leads if there were no leve
is clear that the pressure of that steam would at on
the valve and thus prevent any steam from passing i
space, C, and thence into pipe, H. But the lever, G,
with a suitable weight, will keep the valve down s
allow the steam to pass from B to H. As soon, how
the steam in H, will, together with the pressure
valve, lift the lever and its weight, the valve wil
the passage of the steam between B and C, until su
when the pressure in H has again diminished wil
allow the lever and its weight to press down the valv
as to re-establish communication between B and C.—
ness, &c.

ALPHONSE RENE LE MIRE DE NORMA

Specification of the Patent granted to GEORGE E
DERING, *of Lockleys, in the County of Hertfo*
Improvements in Preserving or Preventing Decom
in Vegetable and Animal Substances and Matters.—
March 28, 1852.

To all to whom these presents shall come, &c.
This invention consists of applying the salts and
produced in the working of galvanic batteries to t
pose of preserving or preventing decomposition in ve
and animal substances and matters, in place of us
metallic salts usually employed dissolved for these pu

My improvements are applicable to preserving or preventing decay in timber, and most vegetable and animal matters; and the same treatment, in some cases, also answers the secondary purpose of improving or altering the quality of fabrics and substances subjected to it; of preparing them for some after treatment, as in dyeing processes, and of rendering them uninflammable. And my improvements also relate to disinfecting and deodorizing fecal and other matters, in order to prevent the emission of effluvia from them, and to render them serviceable as manure.

I am aware that it has long been known that various salts of metals, in state of solution or otherwise, are effectual for these several purposes. But what I have discovered is, that the solutions containing salts of metals which necessarily result from the working of different kinds of galvanic batteries, and which have generally been considered as refuse and thrown away, may be advantageously applied to these purposes. It is well known to persons acquainted with the working of galvanic batteries, that it is always customary and advisable to stop their action before the solution has become saturated with the metal in course of combination with it, in consequence of which the resulting liquids will contain an amount of free acid, or of acid in combination with other matters, as in the case of salts being employed as exciting liquids; and in this respect the processes to which I apply them differ from those in ordinary use for similar purposes. I do not find that this admixture is in general disadvantageous, and in some cases it is even preferable; should it, however, in any case be advisable to purify the solutions or matters, or to neutralize the free acid which they contain, this may be readily effected by some of the processes described in the specification of my patent for "Improvements in the manufacture of certain salts and oxides of metals," dated the twenty-eighth day of March, 1852.*

The salts which I prefer to all others, for the purposes of my present invention, are the sulphate of zinc, and chloride of zinc, which result from the working of batteries in which zinc is employed as the positive element, and in the former case, sulphuric acid or any suitable sulphate as an exciting liquid, and in the latter case hydrochloride acid, or any suitable chloride or muriate; the zinc may be amalgamated

* For the Specification of this Patent, see "Repertory," December, 1853.—Ed.

with mercury, as is well understood, in order to prevent local action. But my invention is not confined to the use of these particular compounds, since the various salts of all the different metals that can be employed as positive elements in batteries are more or less applicable for the purposes referred to. The salt solutions from galvanic batteries are to be used in like manner to what has heretofore been practised when using prepared solutions of salts of like metals, all which is well understood. The solutions obtained may require to be reduced in strength by the addition of water, or to be increased in strength by evaporating a portion of the liquid, or to have their qualities altered by the admixture of ingredients suited to improve their efficacy for the particular purpose to which it is intended to apply them. And in some cases it is advisable to reduce the salts to a solid consistency as described in the specification of my patent for "Improvements in the manufacture of certain salts and oxides of metals," before referred to, and to employ them in this condition, or re-dissolve them for use; all of which will be readily understood by persons acquainted with the processes to which my invention applies. From the foregoing description it will be understood that the purposes of my invention are effected by the use of solutions which necessarily result from the working of different kinds of galvanic batteries, and which have generally been considered as refuse and thrown away, and since the batteries from which they are derived may all the time be employed in producing motive power, light, heat, or chemical action (such as electro-plating or gilding), or other valuable effects as is well understood, it is obvious that the purposes to which my invention applies may be effected at a much cheaper rate by employing these refuse matters than employing solutions made from salts produced by the ordinary process of manufacture. And the working of galvanic batteries will become highly remunerative, as supplying matters fit for consumption, on a large scale for the purposes which I have described, in addition to the ordinary supply of electrical fluid which may be employed to produce motive power for land or water locomotion or stationary use, or any such purposes as steam power is now applied to, or other effects such as those above-mentioned.

I wish it to be understood that I do not confine myself to the details of the description which I have given. But what I claim as my invention is, the employment for the

purposes which I have stated of the solutions and matters resulting from the working of galvanic batteries, whether in the condition in which they come from the battery, or subjected to some after treatment.—In witness, &c.

GEORGE EDWARD DERING.

Specification of a Patent granted to FELIX ABATE, *of* 21, *George-street, Hampstead-road, and* JOHN JULIUS CLERC DE CLERVILLE, *of Newman-street, both in the County of Middlesex, for Improvements in Preparing, Ornamenting, and Printing on Surfaces of Metal and other Substances.*—Dated October 1, 1852.

To all to whom these presents shall come, &c., &c.—This invention consists in dyeing and printing on surfaces of metal, wood, glass, and other substances, by the processes employed in dyeing and printing on woven fabrics, also in marbling such surfaces by the processes employed in marbling on paper, through the medium of a previous coating of such surfaces with a preparation composed of glue and sugar, or plaster of Paris, or other adhesive and absorbent substance or composition.

When relief-printing is used, it is preferred to produce cast plates for that purpose from engraved surfaces of plaster of Paris mixed with wax; also when it is desired to stop out parts of surfaces of metal, &c., the same is done by employing a flexible mould with the desired impression into which wax or resinous matter is run, and from which it is transferred by heat to the surface of the metal or other surface.

We also ornament metal and other surfaces, after having applied, as above, the resinous resist, by means of any of the bronzing, oxidizing parcels of gilding or electro-plating processes.

Our invention also consists of drawing plates of metal between parallel bars with projections or teeth, which produce indents or planishing in lines.

We scour the metallic surfaces by coating them with a solution of glue and hydrochloride of tin (muriate of tin), when dry we take off the coating and burnish the surface.

And in order that our said invention may be mo
understood and readily carried into effect, I will
to describe the means employed by us.

After having perfectly cleaned and polished the
to be printed on, we cover it with a thin coat of
glue and sugar, in the proportion of about three
glue and one of sugar, or with a coat of plaster of P
glue, or with any other adhesive and absorbent comp
When dry, we dye it of any required colour by kee
for a few minutes in a bath prepared with dyeing st
the same ways which are used for woven fabrics.
times we perform this colouring by another process
consists in thickening the dyeing colour with any
above mixtures, and coating with it the surface.
times we omit altogether the colouring part of the
and we make the coat colourless, or we leave it of its
colour. In any of the above cases, when the article
it is ready for printing upon. This printing we
by any of the processes which are used for textile m
tures, besides the following, some of which are
modifications of the said processes.

By our first process we print with engravings u
wood plates, or of gutta percha, and a common p
press; using for printing menstruum any of the dyeing
as well as any solution of metallic or earthy salts
and alkalies, which are used for printing on textile
factures.

The second process consists in printing upon p
glazed calico, with any of the above fluids; stickir
such paper or calico on the prepared surface, wett
water, and detaching it immediately after, when the
sion will be found upon the article. Sometimes we
this process in the following way:—We print upon p
calico in any of the ordinary ways, using either
plates, wood-cuts, or lithography, and a fatty or r
ink, or else we print upon calico with a resinous r
the way used for textile manufactures; then we sti
paper or calico upon the prepared surface. Afterw
wet the back of such paper or calico with any of the
named fluids, and detaching it immediately, the imp
is found upon the article. Another modification
process consists in previously wetting the paper o
with the printing fluid, or printing such fluid upon
a plain block of wood; then printing upon it on th

side in any of the ordinary ways, with a fatty or resinous ink, or with a resinous resist as above, and proceeding for the rest as before described.

By the third process we use engravings made of elastic plates composed of two parts of glue and one of sugar. We either engrave directly on such elastic plates, or we make stereotypes of the said elastic compositions from engravings made on plaster of Paris saturated with wax. In either case we sometimes print with the said plates, using as resist a fatty or resinous ink, and sometimes we use a resist made of three parts of resin and one of tallow, with which we fill the sunken parts of the plates, and then we press the latter upon the article previously warmed. The resist is now transferred from the former to the latter; we finally wash the article with any of the above fluids, and when dry we clean off the resist.

We use particularly the last-described process, besides the others, for printing upon metallic surfaces without any previous preparation than a thorough cleaning. In which case, we wash the article, after the application of the resist upon it, with a solution of any of those salts which produce, through an electro-chemical spontaneous action, an adhesive precipitate of certain metallic oxides upon other metals, or any other chemical change on the surface of the metals with which they are put in contact; such as the salts of copper, cobalt, the black oxide of manganese, and any of those bronzing fluids which are used by brass-workers to give a bronze or dark-coloured surface on copper and brass articles.

We also use the last-described process for the partial or ornamental electro-plating of metallic articles, to produce ornaments in a metal different from that of the ground, which we do by laying the article in the electro-plating bath after having printed, as above, the resist upon it.

We also apply the last-described process for printing on surfaces with metallic powders or leaves, which we do by sticking such powders or leaves on the surfaces in the ordinary ways, after having printed on such surfaces the resist, as above, and then we clean off the latter.

Sometimes we prepare the surfaces by silvering or tinning them in order to increase the transparency and brilliancy of the subsequent colouring.

Besides the above-described processes for printing, we

produce marble ornaments on surfaces, by coating and colouring them in any of the above-described ways, and then placing the article for an instant, and face downwards, in a bath formed by any of the above-named fluids, which have the property of changing the colour of the said coating, upon the surface of such bath a certain quantity of oil, or other fatty fluid, having been previously scattered and dropped about. We also apply for the above purpose the process in use for marbling paper; which we do by placing the article, after it has been coated as above, on a bath prepared in the ways in use for such papers.

Another part of our invention consists in scouring metallic surfaces by coating them with a solution of glue and chloride of tin; and when dry, taking off such coating, and burnishing the surface when a dead colour is not wanted.

And, lastly, our invention consists in producing upon metallic sheets a peculiar kind of ornaments, by drawing them one or more times between a pair of hard steel bars, one of which is cut with a regular and exceedingly short set of teeth. Sometimes we make the effects of such ornaments more striking by previously staining or bronzing the surface of the sheet; and we sometimes apply to the latter, after being so ornamented, any of the colouring and printing processes above described.

What we claim is,

First, the preparing, colouring, printing, and ornamenting of surfaces by the above-described processes.

Secondly, the colouring of metallic surfaces by means of any dyeing stuffs which are used for woven fabrics, thickened with a mixture of glue and sugar, or any other suitable adhesive matter; also the scouring of metallic surfaces by means of a temporary coat of glue and chloride of tin.

Thirdly, the ornamenting of metallic sheets by drawing them between toothed bars.—In witness, &c.

FELIX ABATE.
JOHN JULIUS CLERC DE CLERVILLE.

Specification of the Patent granted to FREDERICK DE LA RUE, *of Bunhill-row, in the County of Middlesex, and* GEORGE WATERSTON, *of Edinburgh, for Improvements in Writing-Cases.*—Dated November 6, 1852.

To all to whom these presents shall come, &c., &c.—The object of this invention is to arrange the necessary parts of a writing-case so as to occupy less space, and, consequently, to make it more conveniently portable, and yet so as to carry comparatively large note-paper and a large blotting-book; and the improvements consist in making the back double, or to have folding flaps, to act as a case to receive the blotting-book and paper.

And in order that the invention may be more fully understood, we will proceed to describe the means pursued by us. The description of writing-case to which our improvements apply, are those which are made to fold in the manner of a pocket-book or portfolio, and wherein there are formed several pockets, or compartments, for receiving writing papers, writing implements, sealing-wax, and other articles suitable for furnishing a writing-case. Heretofore, in such classes of writing-cases, the largest writing paper and blotting-book which such a folding writing-case would receive, has been about half the size of the writing-case when opened out, and our improvements are directed to the so constructing of such like folding writing-cases that writing paper and a blotting-book may be introduced of nearly the full size of the writing-case when opened out. And we believe the most convenient mode of carrying out our invention is, to make the folding covers and back of a writing-case double, using the space between as a pocket, or receptacle for a blotting-book, or for the largest classes of writing paper that the writing-case is intended to carry; and which blotting-book and larger size of writing paper will be folded in the act of folding the writing-case; but such folding of the paper or the blotting-book will not be a sharp bend, so as to injure the paper or the blotting-book. In other respects, the interior of a writing-case is to be fitted up as heretofore, and according to the judgment of the manufacturer. Or, in place of the whole of the back of a writing-case being double, part of the back may be so made double, and suitable for receiving

a blotting-book, and also writing paper of a larger size than the half size of the writing-case when opened out, and this without folding the blotting-book or the writing paper injuriously when the writing-case is folded and shut up. In this arrangement, the interior of the writing-case is otherwise to be fitted up and finished as heretofore, and according to the taste and judgment of the manufacturer. From the above description it will be understood, that the object of the invention is so to construct folding writing-cases that they may be made to receive larger blotting-books and larger writing papers than what is equal to half the size of the case when opened out, such blotting-book or writing paper being received into enclosed, or partly enclosed compartments, behind or underneath the other fittings of the interior of a writing-case.—In witness, &c.

FREDERICK DE LA RUE.
GEORGE WATERSTON.

Specification of the Patent granted to JOHN CHATTERTON, *of Birmingham, in the County of Warwick, for Improvements in Coating Tubes.*—Dated April 19, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of coating a tube composed of gutta percha, india-rubber, or compounds containing such materials, with lead or soft metal, by drawing the metal on to tubes of the softer material.

Having thus stated the nature of my said invention, I will now describe the manner of performing the same. The leaden, or other soft metal tube, is to be made in the ordinary manner, and internally somewhat larger than the tube of gutta percha, india-rubber, or compounds containing such matter or matters, so that the lead, or soft metal tube, may be readily passed over the other material or materials. The lead, or soft metal tube, with the tube of gutta percha, india-rubber, or composition within it, is next to be drawn through a die, or passed between grooved rollers suitable for reducing the diameter of the lead, or soft metal tube, to such a diameter as closely to fit the exterior of the tube within it. By these means, tubes of gutta percha, india-rubber, or composition, will be coated and protected by

lead, or other soft metal, and will offer a new manufacture of tubes applicable for various purposes.—In witness, &c.

JOHN CHATTERTON.

Specification of the Patent granted to WILLIAM DANTEC, *of Liverpool, in the County of Lancaster, for Improvements in Preventing Incrustation in Steam-boilers.*—Dated October 30, 1852.

To all to whom these presents shall come, &c., &c.—This invention consists of combining a filter with a steam-boiler, through which all the water fed to the boiler passes, the lime in the water being acted on by a precipitating agent, such as caustic, baryta, or soluble salts of baryta, including sulphuret of barium, or, in place thereof, oxalate of ammonia; the object of the invention being to decompose and separate the sulphate of lime in the water.

The filter I prefer to use, consists of powdered charcoal between surfaces of hair-cloth, but others may be used.

My invention also consists of the use of hydrate of barytes, or of any of the soluble salts of barytes, including the sulphuret of barium, or of oxalate of ammonia, in order to throw down the earthy impurities, such as the sulphates of lime and magnesia, from the water intended to be used in steam-boilers, for the purpose of preventing the formation of incrustation in such boilers; and I prefer the use of hydrate of barytes.

I mix a solution of one of the substances above mentioned, or a combination of the hydrate of barytes with sulphuret of barium, with or without the addition of a little chloride of barium, according to circumstances, with the water intended to be used for the supply of the boiler, the quantity being proportioned to the quantity of water evaporated by such boiler, by which a precipitate, consisting chiefly of sulphate of barytes, is thrown down, in the state of powder; and I afterwards separate such powder from the water, either by passing it through a filtering apparatus, connected with the engine and boiler; or, where circumstances will admit of it, by allowing the powder to subside to the bottom of the containing vessel; in either case, I use the clear water for the supply of the boiler.

The filtering apparatus consists of a tank of iron, or other suitable material, in which are placed perforated frames, one inside another, the space between the two being filled with powdered charcoal, the frames being so contrived, that the water, which flows into the tank after being mixed with the before-mentioned solution, surrounds the frames and filters through the charcoal into the interior space formed by the inside frame, and is thence conducted, by means of a pipe, into a reservoir attached to the tank, from which it is pumped into the boiler.

For a marine or other condensing engine, I connect the hot-well of the engine and the filtering apparatus by means of a pipe, for the supply of the water thereto; and by means of a small pump, worked by the engine, I supply the proper quantity of the solution of barytes, or other chemical substance, to the water as it passes from the hot-well; the ordinary feed-pump then draws the filtered water off, and pumps it into the boiler, as before mentioned.

For land engines the water may be mixed with the solution of barytes in a tank from which the boiler is supplied, a filtering apparatus being fixed between such tank and the feed-pump, so that the water will pass through it in its passage from the tank to the feed pump, or where it is practicable the water may be mixed with the proper quantity of the solution of barytes, or other chemical substance, in a tank, and the precipitate formed may be allowed to subside, thus dispensing with the use of a filter. I do not, however, confine myself to this particular form of filter, as most of the common forms may be made to answer the purpose.

The precipitate formed, consisting chiefly of sulphate of barytes, is retained in the tank, or filtering apparatus, and may be removed, from time to time, and can be again converted into hydrate of barytes (caustic barytes), or other salts of barytes; thus the same material will be available, after chemical decomposition, any number of times, and the expense will thereby be materially lessened.

To ascertain the proper quantity of the solution of barytes, or of any of the salts of barytes, which it is necessary to use, the following method may be adopted. Take a measured quantity of the water to be tested, and a measured quantity of the solution of barytes, the quantity of barytes in which is known, and add the solution to the water, a little at a time, until no further precipitate is formed, or until a small por-

tion of the water, filtered through filtering-paper, or any unsized paper, such as blotting-paper, no longer becomes cloudy on adding to it a little more of the solution of barytes; another small portion of the water is then filtered and tested with a few drops of diluted sulphuric acid, and if it does not become cloudy, the proper quantity of solution of barytes has been added; and you may now measure the remaining solution of barytes, and so ascertain the proportion which has been used, and it will then be easy to ascertain the quantity which would be required for a given measure of water; if, however, the water becomes cloudy on adding the dilute sulphuric acid, as above directed, it is a proof that too much of the solution of barytes has been added to the water, and it will, in that case, be necessary to add carefully to the measured quantity of water some more of the same kind of water, until the dilute sulphuric acid no longer causes a cloudiness; the quantity of solution of barytes required can now be ascertained, as before directed, making, of course, proper allowance for the water added to the original quantity measured, that is, the measure of solution of barytes, which has been used, is compared with the measure of water operated on, by which the quantity required for any given measure of the water, say one hundred gallons, can be ascertained.

I claim the use of the hydrate of barytes (caustic barytes), or any of the soluble salts of barytes, including the sulphuret of barium; and also the use of oxalate of ammonia, for the purpose of decomposing and precipitating the earthy salts contained in water intended for the supply of boilers; and I also claim the invention of separating the precipitate so formed from the water before it is allowed to pass into the boiler, either by means of a filter, or by allowing it to subside to the bottom.—In witness, &c.

WILLIAM DANTEC.

Specification of the Patent granted to JOHN FULLER, *of Thomas-place, Thomas-street, Kennington, in the County of Surrey, Electrical Engineer, for Improvements in Galvanic Batteries.*—Dated April 19, 1853.

To all to whom these presents shall come, &c., &c.—The object of this invention is to arrange a galvanic bat-

tery, composed of copper and zinc, in such manner that when the battery is not in use, that is, when the circuit is not coupled up, that the fluids employed shall not act on the respective metals; and for this purpose the salts of the metals employed are found to be the best for the purpose, and sulphate of copper in contact with the copper, and sulphate of zinc in contact with the zinc, is what is preferred.

The peculiarity of the invention consisting of the employment for copper a salt of copper, and for the zinc, a salt not acting on the metal when no circuit is made up; and another improvement consists in using plumbago or coke in a powdered state, in a porous cell, as the positive element of the battery.

Having thus stated the nature of my said invention, I will proceed to describe the means of performing the same.

I use troughs divided into separate cells and composed of any suitable material, such as wood coated with marine glue, or of gutta percha, or otherwise, as has heretofore been practised, and is well understood; and I divide each cell into two compartments by a porous partition. Into one compartment, the plate of zinc is placed, and into the other the plate of copper is placed; and into that compartment of each cell where the copper is placed, a solution of sulphate of copper is employed; and in that compartment of the cell where the zinc is placed, a solution of sulphate of zinc is employed. By which means the solutions will not act upon the plates when the battery is not at work.

I would however, remark, that although I prefer sulphate of copper and sulphate of zinc, other salts of those metals may in like manner be used, and the form of the battery or trough may be varied.

In carrying out the second part of my invention, I employ a like trough or apparatus to that above described, that is, having each cell divided by a porous partition, and into one of the parts of each cell I introduce powder of plumbago or of coke, in place of a positive metal, such as copper, and into the other part of each cell I introduce a plate of zinc, or a negative metal; and I connect the zinc or negative metal with the powder of plumbago, or the powder of coke, by a strip of copper, which is fixed in the ordinary manner to the negative metal, and the other end is caused to dip into the powder in the other part of the cell; I prefer to use dilute sulphuric acid in the cells.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that,

What I claim is, the employment of solutions of the salts of copper and zinc in divided cells where pairs of copper and zinc plates are employed in galvanic batteries, as herein described.

And I also claim, the use of powdered plumbago or powdered coke in constructing a galvanic battery, as herein described.—In witness, &c.

JOHN FULLER.

Specification of the Patent granted to FRANÇOIS FELIX VERDIE, *Manufacturer, of Lorette, Department of Loire, in the French Empire, for Certain Improvements in Welding Cast Steel with Iron, Steel, Cast Iron, and other Metals.*—Dated April 12, 1853.

To all to whom these presents shall come, &c., &c.—The article on to which cast steel is to be welded (made of wrought iron, cast iron, steel, or other metal,) is heated to a red heat, then covered with borax and placed in a mould, leaving a space around the article of the size of the coating of steel which it is desired to attach, then immediately the cast steel in a fluid state is run into the mould on to the article to be coated. The whole is then allowed to cool, and the union between the metals will be found to be complete. Supposing, for example, that it is desired to manufacture the tyre of a railway wheel, having a face of cast steel, a ring or circle of tyre iron is prepared in any ordinary manner, slightly smaller than the intended tyre; this is to be heated in a reverberatory furnace to a bright red, almost to a white heat, and then covered with borax, by being moved about in a box containing powdered borax. The heated tyre is then placed in a mould of loam or sand, such as is usually employed for casting articles of iron, and which is so formed as to leave a vacuity round the circumference of the extent of the desired coating of steel, say about one-third of an inch. Great care must be taken to

place the tyre concentrically in this mould, so tha cast steel may be equally distributed round the ci ference.

For welding cast steel on to articles of cast iro process is similar, but the heat should not be so gr for wrought iron—a cherry red will be sufficient. heated article coated with borax is placed in a n leaving a space of the size and shape of the required ing, the melted steel is poured into the mould, an article is afterwards hammered. This process is ver plicable to giving the steel-face to anvils, which are wards tempered in the ordinary manner. For weldin steel on to articles made of steel the process is e similar to that already described for wrought iron. this mould the cast steel (which has been melted neighbouring furnace) is poured, and when the arti cool, it will be found that the adhesion of the steel s or coating is complete. Afterwards, the tyre is finish the exact size required by rolling between rollers, the one of which is cylindrical, and the outer one is gr to the form of the flange of the tyre. Other artic wrought iron may in the same way be coated with such as rails for railways, piston-rods, and articles of a lar nature. It is desirable in all cases to submit a after coating, as above explained, to a rolling or a ha ing process, to make the weld more complete.

Having thus described the nature of my invention the manner of performing the same, I would have derstood that I do not confine myself to the precise described.

But what I claim is, the method herein descri welding cast steel with iron, steel, cast iron, and metals, by first heating the article, then coating it borax, and afterwards pouring cast steel on to it wh a suitable formed mould, and then subjecting it to a r or hammering process.—In witness, &c.

FRANÇOIS FELIX VÉRI

Specification of the Patent granted to ROBERT CHRISTOPHER WITTY, *of* 1, *Portland-place, Wandsworth-road, in the County of Surrey, Esq., for Improvements in the Manufacture of Gas.*—Dated March 12, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of combining vegetable oils with vegetable matters, and pressing the compound into moulds to obtain blocks or bricks, which, being dried, are introduced into a retort, and the gas is distilled therefrom. By preference, a retort divided horizontally is used, the blocks or bricks are introduced into the lower compartment of the retort, and the products pass through a perforated block or partition formed or placed within the upper compartment of the retort, the heat of which prevents any of the products passing without being converted into gas.

Having thus stated the nature of my said invention, I will now proceed to describe the manner in which the same is to be performed, and in doing so, I would state at the outset, that my object is to employ cheap oils to manufacture gas, but not by applying them in the retorts when in the fluid state, as has heretofore been done when making gas from oils, and which is a process of manufacture which has not come into general use, from a variety of circumstances. According to my invention, cheap oils are employed, and are caused to be absorbed by means of dry vegetable matters, which are mixed with the oils to such an extent as to obtain the mixture in a stiff plastic state, so as to admit of the same being formed or moulded into blocks or bricks. The oil and vegetable matters may be mixed in any convenient manner, but I believe that the most convenient mode of mixing is by means of an ordinary pug-mill, such as used for pugging and mixing brick earth, but other means may be resorted to in mixing and preparing the oil and vegetable matter, so as to obtain them in a stiff plastic condition suitable for the purposes of my invention. I cause this plastic mass to be moulded in any suitable mould, and to such sizes of blocks or bricks as may be desired; but I believe that ordinary brick moulds produce a convenient size, and offer a ready means of making the matters into blocks; and I prefer that such bricks or blocks should be well pressed when in the moulds, as is well understood when moulding brick earth. These bricks or blocks I

have stacked in like manner to ordinary bricks to dry, and when dry they are ready for use, and they are to be placed in retorts in like manner to coals, and like retorts, may be used as those employed for making coal-gas; but I prefer to use earthenware retorts, which are divided by a longitudinal horizontal partition extensively perforated with holes, to which form of retort, however, I make no claim. In selecting the oils and the vegetable matters for absorbents or dryers, I am governed by the price, and I use those which I can obtain at the smallest cost; I may, however, state that spent hops or dry peat, or dry and fine saw-dust, are very suitable for the purpose. I do not, however, confine myself to the use of such vegetable matters, but propose to employ others if they can be obtained at a cheaper cost; and I would state that in some cases I have found it desirable to use a small quantity of lime to get more adhesion.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that what I claim is the mode herein described of preparing for and distilling gas from oils combined with vegetable matters.—In witness, &c.

ROBERT CHRISTOPHER WITTY.

Specification of the Patent granted to RICHARD TAYLOR, *of Clayton-bridge, Newton-heath, in the County of Lancaster, Calico Printer, for certain Improvements in Heating Dye Cisterns and Soap Cisterns used in the Process of Calico Printing.*—Dated November 20, 1852.

To all to whom these presents shall come, &c., &c.—The nature of my invention of "Certain improvements in heating dye cisterns and soap cisterns used in the process of calico printing," consists in heating such cisterns by means of steam chests without allowing the steam to mix with the dye liquor or soap liquor; and the manner in which it is performed and carried into effect, is by the introduction of one or more steam-chest coils of piping, or similar apparatus for containing steam, into the dye cistern or soap cistern, so that the liquor becomes more uniformly heated without being weakened by the admission of steam as heretofore; and such my invention being to the best of my

knowledge and belief new, and never before practised. I deliver this as my true and faithful specification of the same. —In witness, &c.

RICHARD TAYLOR.

Specification of the Patent granted to RICHARD QUIN, *of No. 5, Rodney-street, Pentonville, in the County of Middlesex, for Improvements in the Manufacture of Cases for Jewellery for Optical and other Instruments, Miniatures, and other Articles.*—Dated May 3, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of manufacturing the convex and concave parts of such cases by moulding paper or other fabric in moulds. For this purpose counter-moulds of metal or other suitable material are prepared of the forms desired, and in order that the pieces of paper or other fabric may take and retain the desired convexity and concavity without puckering, where the material will not stretch sufficiently, portions are cut away, so that when the cut parts of the paper or fabric come together in the moulds, they will assume the forms desired, and by cement will retain such forms. When sheet metal is used for these purposes in combination with wood, the edges of the metal are raised to the desired form, either to fit into or outside of the frame or edges of wood; such parts are then to be covered and finished, as heretofore.

Having thus stated the nature of my said invention, I will proceed to describe the means pursued by me.

The object of my invention is to save labour in the manufacture of certain parts of cases—the clearer to explain which, it will be necessary to describe the manner of making such parts at present in general use.

When any given shape of case is required, the manner of proceeding is as follows:—A piece of wood is procured of the necessary size and thickness, it is then worked by the tedious process of cutting and gouging until the outside presents a convex, and the inside a corresponding concave form, that is until the wood is brought to an even thickness all over, and this has to be repeated for each case of the particular pattern.

My improvement applicable to this part of the manufacture is as follows:—Two moulds (by preference of sheet iron) are procured of the shape required, the one fitting into the other, loosely enough to admit of several thicknesses of paper being placed between them, the paper is then fitted into the hollow mould by cutting away such parts as would cause a pucker or plait, and by notching or slitting other parts of the paper, so as to allow it to lie smoothly in the mould, several papers are thus fitted and glued, pasted, or put together with any suitable adhesive matter until the necessary thickness is obtained. The other mould is then placed in the hollow mould with the papers between them, and the whole is then placed in a press for a short time, sufficient to give the paper a set form. The mould is then taken from the press, and the inner mould is to be removed, the surplus paper is to be cut off level with the edge of the hollow mould; after this, the paper form is to be taken out and attached to the other parts of the case, in the same manner as the wooden one previously described has heretofore been.

In place of paper, cotton, leather, or other fabric or substance may be used in the manner described. It is found to be an improvement to coat the paper form over, inside and out, with a mixture of glue and lamp-black, or varnish, or similar material, to enable it to be finished off with a perfectly smooth surface.

In making some forms it is found better to lay the paper or material over the solid mould instead of laying it in the hollow mould. And for some forms the moulds are required to be made and put together in several pieces, in the like manner to those used in making articles in plaster of Paris. Where the form requires to be solid instead of hollow, as is the case with the blocks used in the inside fittings of jewellery cases, all that is necessary is, that the hollow parts be filled up with any suitable substance, such as glue and saw-dust, or glue and paper-shavings, or other matters may be employed for filling. When iron forms are used instead of paper, or the matters above mentioned, (which is sometimes found to prevent the cases from warping with the change of weather or other causes,) they are stamped or hammered out of thin metal into the required form; and to attach them to the other parts of the case, which are mostly of wood, it is found to be necessary to turn the edge of the metal, so as to form a rim all round

the edge, which rim drops either inside or outside the woodwork of the other parts of the case, thereby giving a firmer hold to the glue or substance, with which it is fastened to the woodwork of the case.—In witness, &c.

RICHARD QUIN.

Specification of the Patent granted to THOMAS GRAHAM, *of Hatton Hall, Wellingborough, in the county of Northampton, for Improvements in the Manufacture of Covering Materials for Houses, and other Structures and Surfaces.* —Dated May 19, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of combining india-rubber (caoutchouc) and gutta percha with wire-cloth, in such manner that the interstices and surfaces of the wire-cloth are covered over by a thin film of india-rubber or gutta percha, by which means a waterproof covering material is obtained, which is very strong and light.

Having thus stated the nature of my said invention, I will proceed to describe the means of performing the same. The india-rubber or the gutta percha may be used either in sheets or in the dissolved state. If sheet india-rubber or gutta percha be used, the same should be very thin, and a sheet should be placed on either side of the wire-cloth, the surfaces which come together being first coated with india-rubber or gutta percha cement, and such sheets with the wire-cloth between them are then to be submitted to pressure, which is best done by passing them through between pressing rollers; or in place of using sheets of the covering material, a solution of india-rubber or of gutta percha may be applied to the wire-cloth by means of a brush, allowing time for the evaporation of the solvent used before applying succeeding coats of the dissolved matter. By these means the interstices of the wire-cloth quickly become closed, and the desired thickness of coating obtained.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that what I claim is, the coating and filling-up the interstices of wire-cloth with india-rubber and gutta

percha, as herein explained, thus protecting the wire-cloth from corrosion, and rendering it impervious to air or gases, and to water, and any liquid.—In witness, &c.

THOMAS GRAHAM.

Specification of the Patent granted to HERMAN DIRS MERTENS, *of Margate, in the County of Kent, Solicitor, for Improvements in Preparing Materials to be Employed in Making Beer and other Beverages.*—(Communication.)—Dated May 14, 1853.

To all to whom these presents shall come, &c., &c.—Zeilithoid, or grainstone, is the solid vegetable substance which remains after evaporating a decoction or infusion in hot water of bruised or ground grain, either wholly malted, or partly malted, and partly unmalted, or of any other vegetable matter, or refuse of vegetable matter, containing starch or saccharine matter, which has undergone saccharine transformation (Zuckerbildung).

This substance, thus produced, is perfectly hard, and presents a resinous structure and appearance. It is prepared by taking the above-mentioned infusion, or, in other words, any kind of worts, in a good condition, as made or practised by brewers, distillers, and others, and evaporating the water from it by any convenient process applicable to the purpose (though the use of a vacuum pan, heated by steam, is recommended), till the residuum is reduced to a thick syrup. This thick syrup is then poured into heated pans for accelerating and completing the evaporation, which should be further assisted by agitation by mechanical means in the usual manner, and as the continued evaporation renders the liquid still thicker or more viscid, it is kneaded by hand or by machinery, constantly drawing out portions of it into the air, till the slighter or tape-like portions or stripes of it become brittle, and will break like glass. This operation is continued till the mass is so far solidified that it does not adhere to the skin on touching it, when the process is completed, and the substance is moulded or packed in any required form, in strong casks, or other receptacles most convenient for stowage or transmission, so as to protect it in the best possible manner from humidity, or the action of the

atmosphere, and thus preserved it will keep good and unimpaired for a great many years, in any climate.

Zeilithoid, or grainstone, thus prepared, may be used in the production of syrups, by simply dissolving it in water, according to taste, and for various other purposes; but I propose to employ it mainly as the basis of all descriptions of beer and other fermented beverages, in which cases it is desirable to boil the worts for a short time, say from two to three hours, before commencing the evaporating process.

To produce beer from the grainstone it has only to be dissolved in hot or cold water, to reproduce a wort similar to that from which it was reduced by evaporation; the quantity of water to be added being from four to ten times the weight of the grainstone, according as strong or light beer is required; and if the self-fermenting zeilithoid be not used, then yeast must be added to produce fermentation, which must be managed as in ordinary brewing, and the result will be the production of beer, which, if made from zeilithoid or grainstone produced from malt and flavoured with hops, will not differ from beer made in the usual manner, according as the malt and hops used were in quality and proportion adapted to the production of one or other of such beverages.

Since, therefore, the flavour and character of the beer will depend upon the quality and flavour of the grainstone, which in turn depends for these properties upon the materials of which it is made, it follows that the flavour and quality of the beer can be varied to suit different tastes, by varying the materials of which the worts are made, precisely as in the manufacture of beer in the ordinary way.

The aroma and bitter principle of hops, or any other aromatic or bitter principle suited to the purpose, is added either by incorporation with the grain-stone during its manufacture, or added in the shape of an infusion on its being re-converted into worts as above described. When incorporated during the manufacture, it is added either by placing the required quantity of hops, either loose, or what is better, confined in baskets or coarse bags, in the worts during the boiling and evaporating processes, and allowing the same to remain in the worts till they commence thickening, or by incorporating the hops or other bitter principle with the viscid mass when the evaporation is completed; and previously to the moulding and cooling, by which mode the virtue and aroma of the hops are effectually preserved, the

grainstone completely keeping them from deterioration, so long as it preserves its own virtue. The grainstone may thus, when desirable, be made the medium of preserving hops, not only for grainstone brewing, but for the use of brewers and others in their ordinary brewings, to which they may thus invariably impart the virtue and aroma of new hops.

Yeast may also be preserved in the grainstone, as may also diastase or any other matter capable of producing fermentation, by mixing it with the grainstone after the evaporation is completed, and the mass is cooling and ready to mould or pack, by which means the production of beer is ensured even in localities or under circumstances where yeast cannot be procured.

Stout or porter grainstone is obtained by using the usual quantity of wasted malt, or other starchy matter, in the same proportion as used by brewers generally for making the worts.

Ale zeilithoid, or grainstone, is obtained in the manner first hereinbefore detailed, adding a greater or less quantity of hops to the grainstone (either during its manufacture or afterwards, as above set forth), according to the description of ale required.

Small or light beers are obtained by using more water to the ale zeilithoid than in making ale, according to the strength required.

The zeilithoid, particularly the ale zeilithoid, may also be used with very great advantages in the production of yeast for bread, or for any other purpose, in warm climates, on shipboard or elsewhere, where yeast cannot be preserved, or is not readily attainable. For this purpose, it is only necessary to make a strong solution of the ale zeilithoid or grainstone, in the proportion of one part of the grainstone to three parts of water, standing the vessel in a temperature of about seventy-five degrees of Fahrenheit, though the temperature may be higher or lower, when it will spontaneously ferment and produce yeast of an excellent quality.

In regard to the quantity of beer to be brewed at one time from the grainstone, it gives the facility of brewing any quantity from one gallon and upwards, though the larger the quantity the better the beer.

In regard to the water to be used in brewing with this material, it gives the peculiar advantage, in cases of necessity, of using spring or hard water, once distilled sea water, or even stagnant water, or any other water not otherwise

absolutely injurious, with little or no perceptible difference from the best soft water; thus, under certain circumstances, producing a wholesome beverage from water otherwise undrinkable.

The most prominent advantages of this invention may shortly be enumerated as follows:—

1st. The facility afforded by it of brewing good beer in all climates and under every temperature, and from one gallon upwards.

2d. The property of spontaneous fermentation, and of producing yeast in high temperatures.

3d. The indestructible nature of the substance, which retains its qualities unimpaired either by time or climate.

4th. The extreme simplicity of the process by which it is converted into beer or other beverages requiring no fire or brewing utensils, thus enabling the very poorest classes to brew a cheap and good beer.

5th. The facility of using cold water with equal advantage where warm water cannot easily be procured, or where the saving of fire is an object.

6th. The rendering sea water drinkable after being once distilled, and rendering other kinds of water serviceable for brewing, which hitherto could not be used with advantage.

7th. Its condensed form (producing from four to ten times its weight of beer), and the consequent saving of freight and stowage.

8th. Its great importance as the medium of preserving hops in all their virtue, strength, and freshness in seasons when they are good and abundant; and

9th. As the medium of preparing beer in a concentrated and indestructible form when barley or other grain is plentiful, and thus providing against seasons of scarcity.—In witness, &c.

HERMAN DIRS MERTENS.

Specification of the Patent granted to JAMES GREENWOOD, *of New Accrington, for Improvements in Fixing Mordants on Fabrics.*— Dated May 2, 1853.

To all to whom these presents shall come, &c., &c.—The improvements consist in the application of chloride of

lime, or chloride of soda, or chloride of potash, alone, or in combination with carbonate of lime, or carbonate of soda, or carbonate of potash, or carbonate of ammonia, or other alkaline or earthy body or metallic oxide. The object of the invention being the use of chloride of lime, or chlorine in combination with other base than lime, for the purpose of fixing mordants.

Having thus stated the nature of my said invention, I will now proceed to describe the manner in which the same is to be performed.

I prefer to employ the chloride of lime mixed with carbonate of lime, but the chloride of soda, or other chlorides, may be used. I proceed as follows:—

I take, by preference, a solution of chloride of lime, or it may be other chloride, as before mentioned, equal to ten pounds of the dry powder, or ten gallons of the clear solution of chloride of lime, at the specific gravity of 1·035; to this solution I add about eighty pounds of pulverized carbonate of lime, or, instead of the carbonate of lime, I use twelve and a-half pounds of crystallized carbonate of soda, or fourteen pounds of carbonate of potash (crystallized), or four pounds of carbonate of ammonia, or five and a-half pounds of muriate of ammonia, and the mixture is added to about 700 gallons of water, at about 160 degrees Fahrenheit's thermometer, in a cistern, which is provided with a double series of rollers, for the purpose of passing the calico pieces through the mixture; the goods printed with mordants, or otherwise prepared (as is well understood by printers), are passed through this mixture, and kept in during the space of one minute or thereabouts, fresh portions of chloride of lime, or the other chloride which may be employed, and carbonate of lime, are added from time to time, in the proportion of three quarts chloride of lime, solution of the specific gravity of 1·035, and three pounds carbonate of lime, to every 300 yards of cloth; or, instead of the carbonate of lime, I use fourteen ounces carbonate of soda, or one pound carbonate of potash, or five ounces carbonate of ammonia, or six ounces muriate of ammonia; the mixture is mixed with about ten gallons of water and then added to the mixture in the cistern, the temperature of which is kept about 160 degrees Fahrenheit. I have found that any temperature from 120 degrees to the boiling point will do, but I prefer 160 degrees. The goods are washed, and then put into the dye bath.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood, that what I claim is, the application of chloride of lime (known in commerce as "Bleaching-powder"), or chlorine, in combination with other bases than lime, for the purpose of fixing mordants on fabrics.—In witness, &c.

JAMES GREENWOOD.

Specification of the Patent granted to JAMES HIGGIN, *of Manchester, in the County of Lancaster, Manufacturing Chemist, for Certain Improvements in Bleaching and Scouring Woven and Textile Fabrics and Yarns.*—Dated June 24, 1852.

To all to whom these presents shall come, &c., &c.—My invention relates particularly to improvements in bleaching and scouring woven or textile fabrics and yarns, and consists in the use of a certain compound to be applied in the operation technically known as bowking or kiering, instead of, or in connexion with, the ordinary process of boiling in a solution of soda ash, or solution of resin in soda ash. I singe and wash the cloth or yarn to be bleached or scoured (say about three thousand five hundred pounds weight) in the ordinary manner, and put it in a kier, and whilst the said cloth is folding I throw over it milk of lime formed by slacking two hundred and twenty-four pounds of quick lime with water, so as to form a convenient solution; or the cloth or yarn, previous to entering the kier, may be padded or passed through the said milk of lime in such a manner that the lime shall be equally absorbed by it. I then add a sufficient quantity of water, and from one to two gallons of chloride of lime solution, marking eight degrees on Twaddell's hydrometer. I then turn the steam on, and keep the liquor boiling about fourteen hours, after which the cloth or yarn is removed, washed in water, and steeped or passed through diluted sulphuric acid, which may mark three degrees on Twaddell's hydrometer, or muriatic acid marking two degrees. On leaving this solution the cloth or yarn must be washed in water, and folded into a kier, into which I previously put the following mixture: In an iron or other vessel I put thirty

gallons of water, one hundred and twenty pounds of soda ash, and eighty pounds of American resin, or gum-thus, or any other cheap and efficient resin. I boil this compound for eight hours by a steam pipe or other convenient apparatus, and then put into it twenty-five pounds of lime, which must be previously slacked to a paste with water. I then boil this mixture six hours more, and transfer it to the kier; after which the cloth or yarn is folded in, as before described; sufficient water is then added, and the liquor boiled by steam for about fourteen hours. In some cases I prefer to boil the mixture of resin and soda ash in water for fourteen hours, then put it in the kier, and add the lime slacked and mixed with water: then turn on the steam and boil it about twenty minutes; after which the cloth or yarn is entered and boiled as before stated. When the cloth or yarn is sufficiently boiled it must be removed and washed with water; then steeped in or passed through a dilute solution of chloride of lime, marking quarter degree on Twaddell's hydrometer. It may be wet for a few hours, or may be immediately steeped or passed through dilute acid, namely, sulphuric acid, marking three degrees, or muriatic acid marking two degrees, on Twaddell's hydrometer. It must then be washed and dried. In some cases it may be convenient to give the goods a second boil in a kier, with the aforesaid mixture of resin, soda, and lime, but in smaller quantities, or in a solution of resin in soda ash, or in a solution of soda ash alone; but for most purposes the aforesaid process will be found sufficiently effective.

Having now fully described the nature and particulars of my said invention, and the manner of carrying the same into practical effect, I wish it to be distinctly understood that I do not confine myself to the precise details herein described, or to the exact quantities herein mentioned, as such may be varied or modified without departing from the principle of this my invention. Neither do I claim as new the separate use of soda ash, resin, or lime, in boiling, or the acids herein named, or chloride of lime in steeping, or any particular routine of treating the fabrics or yarn.

But I claim as my invention,

First, the combining together, in a mixture, soda ash, or caustic soda, resin or resins, and lime, for the purpose of boiling cloth or yarns, to be bleached and scoured as hereinbefore stated.

Secondly, any mixture of resin or resins with soda or alkali and lime to be used in boiling cloth or yarns, as aforesaid.—In witness, &c.

JAMES HIGGIN.

Enrolled December 23, 1852.

Specification of the Patent granted to EDWARD MANIERE, *of Bedford-row, in the County of Middlesex, Gentleman, for Improvements in the Manufacture of Paper.*—Dated June 9, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of applying asbestos in the manufacture of paper. For this purpose, the asbestos is to be pulped and made into paper, in like manner to what is practised in making paper of other materials; but by the employment of asbestos a fire-proof paper will be produced. Having thus stated the value of my said invention, I will proceed to describe the best manner I am acquainted with for performing the same.

In order to render the asbestos less brittle, I find it desirable, before reducing it into pulp, to boil it for about an hour in water. The asbestos is then reduced into pulp, as when making paper of other fibrous materials; and in order to get more adhesion in the reduced or pulped asbestos, I find it advantageous to dissolve alum in the pulp at the rate of about one ounce troy to each pint of water in the pulp. The pulp is then made into paper in the ordinary manner of paper-making when using pulp of other materials. Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is the manufacture of paper of asbestos.—In witness, &c.

EDWARD MANIERE.

Specification of the Patent granted to WILLIAM BRADBURY, *and* FREDERICK MULLETT EVANS, *of Whitefriars, for Improvements in taking Impressions and producing Printing Surfaces.*—Dated May 11, 1853.—(Communication.)

To all to whom these presents shall come, &c., &c.—This invention consists of placing plants and other vegetable matters, insects, and other substances between a surface of steel and a surface of polished lead, and by pressure obtaining an impression on the lead, and from such impression obtaining an electrotype surface suitable for printing.

Having thus stated the nature of our said invention, we will proceed to describe the means of performing the same. We employ sheet lead, and for this purpose the surface thereof on which an impression is to be taken is to be made smooth by scraping and polishing. This prepared surface is then to be placed in contact with a polished surface of sheet steel, and passed between a pair of pressing rollers, by which the surface of the lead will be rendered very even and suitable for receiving an impression from the surface of a plant or a leaf or other vegetable matter, or from a feather, or from an insect, or other surface: and this is accomplished by placing the plant or other matter, in a flat and dry state, between the lead and the steel plate. The two plates are then to be subjected to pressure by passing them between pressing rollers or otherwise. The impression on lead thus obtained is to be used for the purpose of obtaining therefrom an electrotype plate of copper, as is well understood, by depositing copper thereon; and we prefer, for this purpose, to use a solution of sulphate of copper. Having obtained a plate of copper by such means, we cause the face thereof to be burnished at those parts where the impression does not come; and we then use this first electrotype plate in order to obtain a second electrotype plate, by depositing copper thereon, and by preference from a solution of sulphate of copper. This second copper plate is the one used as a printing surface, and impressions are taken or printed therefrom in the ordinary manner of printing from engraved plates.

Having thus described the nature of our invention, and the manner of performing the same, we would have it understood that what we claim are the combined means, herein described, of taking impressions and producing

printing surfaces; and we claim the employment of lead for obtaining impressions, and for receiving electro depositions of copper.—In witness, &c.

WILLIAM BRADBURY.
FREDERICK MULLETT EVANS.

Specification of the Patent granted to HENRY BESSEMER, *of Baxter-house, Old St. Pancras-road, in the County of Middlesex, for Improvements in the Manufacture of Waterproof or partially Waterproof Fabrics.* — Dated June 18, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of coating cotton and other yarn or thread previous to weaving the same into a fabric, with a waterproofing solution, preferring for such purpose a solution containing india-rubber, or resinous gums not soluble in water, by which not only may great lustre be obtained, but the yarn or thread will be waterproof. When dry, the yarn or thread is to be woven into fabrics in the ordinary manner, by which means the woven fabric will be waterproof, or for the most part waterproof, and yet permeable to air.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

A great variety of waterproof fabrics have hitherto been made, either by the combination of two fabrics with india-rubber or other adhesive matter between them, or by preparing the surface of the said fabrics with some waterproofing material after it has been woven, whereby the interstices of the fabric are closed, and it is rendered waterproof. In either case, much inconvenience results from the impervious character of such fabrics, which prevents the passage of air through them, and they are in consequence more or less injurious to health when worn constantly. Now the object of my invention is the production of a fabric which is pervious to air, but which does not admit the passage of water readily through it, as is the case with ordinary fabrics not so prepared; and which said invention consists in coating cotton or other yarn or thread, previous to weaving the same into a fabric with a waterproofing solution, whereby such cotton yarn or thread is prevented from absorbing

water by capillary attraction, in consequence of the pores of the cotton or other yarns being filled with or covered by the waterproof material. For this purpose I prefer a solution of resinous gums, which are to be deprived of their hard and brittle qualities by admixture of india-rubber, or with linseed oil reduced to a gummy state by absorption of oxygen in the process of boiling or burning, as is well understood. In preparing the materials for waterproofing yarns, gum, copal, anime, or amber are to be combined with boiled linseed oil and turpentine, in the same manner as is commonly practised in the manufacture of copal varnish. While these materials are still in a heated state, a solution of india-rubber in turpentine, of about the consistence of thick treacle, is to be added, in the proportion of one part of the solution of india-rubber to two parts of solution of copal; and the whole well incorporated by stirring vigorously for an hour, at a temperature of about 150 degrees of Fahrenheit. When the cotton or other yarns or threads are of a light colour, care should be taken to select gums of a pale colour, in order that the colour of the yarns may, as far as possible, be preserved; but when a black colour is desired to be given to the yarns, I not only dye the yarns of that colour, but I use the black japanned varnish used to japan iron, and render it tough or pliable by an admixture of about one-third part of india-rubber solution; or in lieu of this I employ the same quantity of linseed oil, which I first heat to a temperature of about 300 degrees Fahrenheit, and then pass jets of oxygen gas through it, until it acquires about the consistency of treacle; it will be obvious that a great variety of resinous substances or oxydized oil may be combined and used for the purpose of my invention; and it will, therefore, be unnecessary here further to particularize them, they forming in themselves no part of my invention. The waterproofing material I prefer to apply to the cotton or other yarns or thread in the following manner:—one end of the thread is unwound from the reel which holds it, and is passed beneath a small roller, which is placed in the bottom of a trough containing the waterproofing composition; the end is then passed through a small incision formed in a piece of vulcanized india-rubber or leather, which extends along one side of the trough; the end is then fastened to a flyer or winder, on which it is wound, care being taken that the prepared thread does not lap one over the other. The thread, in passing into and out of the waterproofing compo-

sition, will become coated therewith, and any superfluous quantity of the composition will be removed by the passage of the thread through the incision in the india-rubber or leather scraper; any number of threads may be passed from appropriate reels, and be made to pass under the roller parallel to each other, and be wound as described. The flyers, when covered, may be removed into a warm room to dry, after which they will be in a fit state to be woven into a waterproof or partially waterproof fabric. I have hitherto only referred to the property of such cotton yarns or threads in repelling water; but the peculiar lustre obtained by this process will render such yarns suitable for producing ornamental fabrics when used alone, or in combination with other yarns or silk not so prepared, and will at the same time render fabrics composed of such mixed materials partially waterproof.

Having now described the nature of my invention, and in what manner the same is to be performed, I desire it to be understood that I do not confine myself to the precise methods and materials herein specified, so long as the peculiar character of my invention is retained.

What I claim is, the manufacture, herein described, of waterproof or partially waterproof fabrics.—In witness, &c.

HENRY BESSEMER.

Specification of the Patent granted to EDWARD DUCLOS DE BOUSSOIS, *of Paris, Mining Engineer, for Improvements in Preventing Incrustation in Steam-boilers.*—Dated May 28, 1853.

To all to whom these presents shall come, &c., &c.—Heretofore, amongst other matters, muriatic acid has been applied in some cases to the purpose of preventing incrustation in boilers, and in other cases muriate of barytes has been used for like purposes. Now the object of my invention is to combine the use of muriatic acid and muriate of barytes at one and the same time, by which means more beneficial results are obtained.

Having thus stated the nature of my said invention, I will proceed to describe the means pursued by me.

I ascertain by chemical analysis the composition of the water to be supplied to the boilers; I prepare the solution

containing the muriate of barytes and muriatic acid accordingly, and in such proportion, so as to render and convert the salts of magnesia, lime, or other basis, which would deposit by ebullition, into solubles and neuter muriates, for instance, when the water of alimentation is saturated with sulphate and carbonate of lime; according to circumstances, it may contain two in thousand parts of sulphate of lime, and one or more or less of carbonate of lime in thousand parts, the quantity of this last salt will vary much, as it is held in solution in water only by the action of the carbonic acid contained in spring or mineral waters. In such case, in a wooden barrel or other suitable vessel, I prepare a chemical solution containing the following:—Water four hundred and fifty pounds, crystallized muriate of barytes a hundred and twenty-five pounds, muriatic acid of 1·20 specific gravity twenty-five pounds; when the muriate of barytes is dissolved it is fit for use, for instance, when the water to be supplied to the boilers can be conveniently placed in tanks or reservoirs, the vessel containing the chemical composition is disposed in such manner as to permit the delivery of fifteen pounds or thereabout of the above solution to the water operated upon, and this for hundred gallons or thousand pounds of water; the supply is regulated by means of taps or cocks, or such other arrangements as will best ensure its regularity, proper means being taken to have the whole well mixed; a double decomposition takes place, muriate of lime is formed and sulphate of barytes. The first remains in solution, the second precipitates to neutralize any excess of free acid which might be left; I place fragments of broken limestone in a cane basket or other suitable wood, near or upon the orifice of the eduction pipe or channel, through which the water is brought to the feeding pumps of the boiler, thus forming muriate of lime; the solution prepared according to the chemical equivalents of the salts held in solution in the water to be operated upon, may be applied in any tender, reservoir, or tanks of any locomotive, marine, or land boiler, in such quantity as to form the muriate of lime and sulphate of barytes, with the addition of broken limestone, as above described.

I claim the use of muriatic acid and muriate of barytes combined, and the use of carbonate of lime, as above described.—In witness, &c.

EDWARD DUCLOS DE BOUSSOIS.

Specification of the Patent granted to AUGUSTE EDOUARD LORADOUX BELLFORD, *of Castle-street, Holborn, for An improved method of Treating Flax.*—Dated May 23, 1853.

To all to whom these presents shall come, &c., &c.—My improved method of treating flax and hemp differs from that known as "Claussen's process," which is so defective in its nature, that, although the flax so prepared has been intended to be worked by machinery employed in the manufacture of cotton, yet it has been found impossible, after repeated trials, to so work it; hence it has been necessary to construct new machinery to work the flax treated by that process. M. Claussen employs an alkali and acid to generate carbonic acid gas in the fibres of the flax, and thus split them. An alkalic renders flax pulpy, and destroys its fibre, hence the nature of the alkalic is not adapted to preserve the fine fibre of the flax so as to render it susceptible of being worked successfully on the same machinery as is now employed in working cotton and wool. My discovery or invention cottonizes, or splits the flax into fine fibres, and preserves them from becoming pulpy, retains their strength, and renders them (the split flax) perfectly susceptible of being worked with the greatest ease on any machines now used for manufacturing cotton or wool into yarn or cloth.

My invention consists,

First, In the employment of a solution of the sulphate of alumina, alum, borax, common salt, epsom salt, glauber salt, nitre, sal-ammonia, or an equivalent of any one of these, in which the flax is immersed in order to split the flax into fine fibres, whose strength and ductility is so preserved as to enable them to be carded, spun, and woven on these kinds of machinery already mentioned.

Secondly, In bleaching the said flax in the aluminous, borax, or other solution, by the employment of the chloride of lime, or the chloride of soda or potash in the said aluminous borax, or other solution, I take unrotted flax and cut it into such lengths, from one to any number of inches desired, to have it such a length of staple as may be required by the manufacturer for the particular kinds of goods he intends to use it in. It is cut in a machine

similar to a straw-cutter. This cut flax is then subject to the action of steam, in any proper steam-tight vessel, for about eight or ten hours; it is then taken out and dried. After this it is broken on a cotton lapping machine, when it becomes fit for the splitting or cottonizing process. This process is conducted as follows:—I take a proper vessel of wood or metal, and of such a size as may be required for the amount of flax to be operated upon. In this vessel I make up a solution of about one pound of alum, or sulphate of alumina, or any of the other salts or substances named, such as borax, &c., for every one hundred pounds of flax to be treated, in as much water as will saturate and cover up the said flax in the said vessel. The flax is allowed to remain in this solution from five to twenty minutes, during which period the said solution so acts upon the flax, as to open up or split it into very fine fibres, and while the solution so acts upon the flax as to split it into very fine or cotton fibres it also preserves its strength and toughness. After this the split flax may be bleached in the ordinary way, but to save time and labour I bleach the said flax in an aluminous, or borax, or salt and chlorine solution. I do not confine myself to the set time which is stated to be required for the flax to be split in the aluminous, borax, or salt solution; but, whenever it is judged, by observation, that the said flax is split, I pour in a solution of the chloride of lime. For one hundred pounds of flax, I employ from five pounds and upwards of the chloride of lime stirred up in water and then allowed to settle. I then take the clear liquor of this solution and pour it into the vessel containing the flax, in the aluminous, borax, or salt solution, and allow the flax to remain in this compound liquor for about from ten to twenty minutes, at the end of which time the flax is found to be bleached into a beautiful white. After this the flax is taken out and washed thoroughly in clean water, and afterwards dried, when it is fit to be worked upon any kind of cotton or woollen machinery for making yarn or cloth. This has been repeatedly done with the most gratifying results. The process is simple and economical; and flax and hemp thus treated are fitted to be worked upon cotton or woollen machinery, and can be made into yarn or cloth. The flax thus treated becomes, as aforesaid, fit for manufacturing into cloth at a very small expense, and textile goods, made from flax thus treated, are produced as cheaply as those made of cotton.

Having thus fully described the nature of my invention, I claim treating flax or hemp with an aluminous solution in the manner substantially as described, or treating flax or hemp in a solution of either alum, borax, chloride of soda, sulphate of soda, sulphate of magnesia, nitrate of potassa, or sal-ammonia, or an equivalent of any one of these, in the manner substantially as described for the purpose set forth.

I also claim the bleaching of the said flax in the aluminous solution in the manner set forth, and for the purpose described.—In witness, &c.

AUGUSTE EDOUARD LORADOUX BELLFORD.

Specification of the Patent granted to JOHN HORROCKS, *junior, and* JAMES DUNLOP HORROCKS, *of Down-street, Piccadilly, in the County of Middlesex, for Improvements in the Manufacture of Detonating or Percussion Caps.*—Dated June 8, 1853.—(Communication.)

To all to whom these presents shall come, &c., &c.—The object of this invention is to manufacture percussion caps in such manner that the interior surfaces or lining may be flexible and elastic, in order that a cap may tightly and closely fit different nipples, though they may somewhat differ in size and shape, and also fit each nipple in a manner to be waterproof. In manufacturing percussion caps, according to the invention, they are to have their inner surfaces composed of a flexible elastic and waterproof material or materials, and for this purpose gutta percha is believed to be the best substance.

The manufacture of percussion caps when waterproof elastic matters are used on the interior, does not so far as the details of the making are concerned largely differ from what is now pursued in manufacturing such caps of metal. When percussion caps are to be made according to the invention, having an outside covering of thin metal, the means pursued are as follows:—A metal cap similar to that heretofore made, but it is recommended to be of thinner metal, is placed in a hole (in a plate with a piston at the bottom, capable of raising the cap out of the hole when the cap is finished), and a quantity of gutta percha (suitable to form the interior) rendered plastic by heat, is to be put into the metal cap, and then by the pressure of

a plunger (of a size corresponding with the interior of the cap when formed) the gutta percha is caused to spread and assume the interior form of the desired cap. The gutta percha is allowed to cool for about half a minute, the plunger is then to be withdrawn, and the detonating powder in a pulverized state or in the shape of a sphere is to be introduced into the cap or disc of copper, or brass, or other thin metal (which is to fit the interior of the cap tightly) is next to be forced down to cover the powder, the rough or protruding edges of the gutta percha are to be cut off, and the cap will be ready for use, and will by reason of the elasticity and waterproof character of the interior surface fit on to a nipple and form a waterproof joint thereon. In place of metal, calico or other woven fabric, or other material may be used for the outside covering of caps. It is preferred to have an outside covering, and such material is to be cut into the form of a cross, as when making metal caps, and such crosses are to be forced into dies or holes, such as above mentioned by plungers, and the gutta percha is to be introduced and pressed into form, as above explained, and the percussion powder introduced, as before stated. On to the powder a disc of tin foil is placed, after which a disc (with the centre portion punched out) of copper or brass, or other thin metal is forced into the cap. The rough edges of the gutta percha are to be trimmed off, and the caps will be complete.

Having thus described the nature of the said invention, we would have it understood that we do not confine ourselves to the detail, as the same may be varied without departing from the peculiar character of the invention.

But what we claim is, the manufacture of percussion caps herein described.—In witness, &c.

JOHN HORROCKS.
JAMES DUNLOP HORROCKS.

Specification of the Patent granted to HENRY BESSEMER, *of Baxter-house, Old Saint Pancras, in the County of Middlesex, for Improvements in Apparatus for Concentrating Saccharine Fluids.*—Dated May 19, 1853.

To all to whom these presents shall come, &c., &c.—This invention is intended to prevent the injurious effects of

high temperatures on saccharine fluids while undergoing the process of evaporation in vacuum pans, for which purpose I use hot water as a means of transmitting heat to the fluid under operation, although other hot fluids may be used in lieu thereof, all such fluids being at or lower than the ordinary boiling temperature of water, or 212 degrees Fahrenheit; warm air may also be used, or steam at a pressure not exceeding that of the atmosphere, may also be substituted as a means of transmitting the requisite low degree of heat, although liquids will be found preferable on account of the absence of that amount of latent heat which steam contains. In consequence of this reduction in the ordinary temperature applied to the fluid matters in vacuum pans, a much larger extent of heating surface will be found necessary in order not to lessen the evaporative power of a pan; but as this augmentation of surface, if consisting simply of additions to the usual horizontal pipe, or worm within the pan, would be apt to become clogged with the granulated sugar, and would also impede the free circulation of the fluid, a double or treble coil of pipes may be used in lieu of the single coil now in general use; and to avoid the clogging referred to, it will be found desirable so to construct the said coils of pipe that each portion thereof may be placed vertically over the corresponding portion of the other coils, whereby a free space will be left between them for a simple circulation of the fluid to be carried on in a vertical direction; and by this means a sufficient amount of heating surface and freedom of motion may be obtained at a less cost, and with less complication, than an arrangement of vertical heating pipes, which I thought preferable in the early stage of the invention; at the same time such arrangement may be resorted to if preferred; and here I would remark that neither arrangement of the heating surfaces forms any part of the invention which I desire to secure by these letters patent; and I may state that the same beneficial results may be effectively (though more slowly) obtained by the use of hot water, or other fluid, in the ordinary coil of pipes now in general use. I have, however, pointed out the mode which, according to my present knowledge, I consider the most efficient and economical way of arranging the heating surfaces required in carrying out my invention.

I have before stated that hot fluids of various kinds may be employed for the purposes of this invention, but I prefer

water to any fluid, and to use it at a temperature of about 130 to 140 degrees Fahrenheit, at the commencement of the process of concentration, which temperature may be gradually increased to about 160 to 170 degrees Fahrenheit towards the close of the operation, because the aqueous parts of the fluid are less easily separated as the syrups increase in density. The mode of heating the water and causing the same to circulate in pipes is so well known and so generally practised for other purposes, that I do not consider any detailed account of such methods necessary, as any means by which the temperature can be controlled and applied with facility and economy may be used, both to the heating of water or whatever other fluids may be substituted or used in lieu thereof. With regard to the use of steam at a pressure exceeding that of the atmosphere, which is now used to transmit heat to saccharine fluids in vacuum pans, I desire it to be distinctly understood that I have discovered that an injurious chemical change is effected in such syrups as are brought in contact with pipes in which there is steam at a pressure exceeding that of the atmosphere, and consequently of a temperature exceeding 212 degrees Fahrenheit, and also that such injurious action is greatly reduced by lessening the temperature of the heating media to points ranging from 130 to 170 degrees Fahrenheit, or thereabout. But if, from any local or other circumstance, it is desired to effect the concentration of saccharine solutions in vacuum pans by the use of steam instead of hot water, care should be taken that the pressure thereof be less than that of the external atmosphere. And, in order that steam may be kept at the low and requisite pressure, I establish a communication between the discharge end of the steam coil and the condenser of the vacuum pan; and upon the pipe which forms this communication I place a loaded valve, similar to an ordinary safety-valve, one side of which valve will be pressed upon by the steam in the coil, while on the opposite side of it there will exist a vacuum, or nearly so; if, for example, we assume the atmospheric pressure to be equal to fifteen pounds on each superficial square inch, and the valve be loaded to nine pounds per square inch; then, whenever the pressure of the steam in the coil approached the pressure of the external atmosphere within six pounds per square inch, it will balance the loaded valve, and any excess of pressure beyond that amount will raise the valve and allow the steam to escape into the condenser,

and thus prevent any increase of pressure beyond that which is desired, and which may be regulated by the weight applied to the loaded valve. The outside of the pan may be jacketed in the usual way; and if steam at a pressure not exceeding that of the atmosphere be employed, the same means may be used for securing the requisite low temperature as before described, in reference to the coil of pipes occupying the interior of the pan; so also when water or other heated fluids are used in lieu of steam, the jacket of the pan may be used to assist in the transmission of heat to the saccharine fluid therein contained. The mode of supplying the syrup from time to time, the valve for discharging it, and the proof-stick, eye-hole, and other general fittings of the pan, are constructed and used in the ordinary manner.

The vacuum pans in general use are constructed of copper, and are very expensive, both on account of the material and the labour entailed in their construction. I, therefore, prefer to construct the pan of cast-iron, the central or body part of the pan being of a cylindrical form; and the upper and lower sides being cast separately and bolted by flanges to the cylindrical part, all the joints should be turned true, and the whole either galvanized or tinned, to prevent the rusting of the iron, or the interior may be enamelled or coated with glass or other vitreous compound, after the manner usually practised in such manufactures. This last named mode of protecting the surface of the iron will be found to affect the sugar less than any metallic surface heretofore used.

Having now described the nature of my said invention, and the manner in which the same is to be performed, I would have it understood that what I claim is,

Firstly, the use of hot water or other heated fluids, at a temperature not exceeding 212 degrees Fahrenheit, for the purpose of transmitting heat to saccharine fluids contained in vacuum pans.

Secondly, I claim the use of steam at a pressure not exceeding that of the atmosphere, or below a temperature of 212 degrees Fahrenheit, for the purpose of transmitting heat to saccharine fluids contained in vacuum pans.

Thirdly, I claim the use of air or other aëriform fluids at a temperature below 212 degrees Fahrenheit for the purpose of transmitting heat to saccharine fluids contained in vacuum pans.

Fourthly, I claim the mode herein described of reg
the pressure of steam, when used at a pressure bel
of the atmosphere.

Lastly, I claim the construction of galvanized, tin
enamelled cast-iron vacuum pans, as herein describe
witness, &c.

HENRY BESSE

Specification of the Patent granted to URIAH SCO
No. 155, *Grove-street, Camden-town, in the Co*
Middlesex, for Improvements in the Manufacture of
lar Rods and Rings for Furniture.—Dated Ap
1853.

To all to whom these presents shall come, &c.,
The object of this invention is to deaden the soun
sequent on using hollow metal rods and hollow metal
and consists of filling or partly filling the interio
sand or other powder, or granular matter, or fluid t
to prevent vibration of air, and inclosing and re
such sand or matter within the tubes and rings.

Having thus stated the nature of my invention,
proceed to describe the means of performing the sam

Hollow metal rods to be used for curtains and
articles of furniture, and also metal rings, which
move on rods in place of being left hollow, as here
are according to my invention to be filled so as to e
air, and such filling may be sand, saw-dust, or
powder, or granular matter, or even water. I h
prefer dry powder for the purpose, and in making t
rods I close one end by soldering or otherwise fi
closed end thereto; I then fill the tube with sand
dust, or matters, as above mentioned, and then clo
other end by soldering or otherwise fixing a close
thereto, and in making rings by bending tubes int
form I use like fillings, and close the ends so as t
in such filling in place of closing the ends when the
are empty.

By these means, metal tubes made into furniture
and rings, have the sound materially deadened, and ar
sequently rendered more useful.—In witness, &c.

URIAH SCO

Specification of the Patent granted to ARISTIDE MICHEL SERVAN, *of Philpot-lane, in the City of London, for Improvements in Treating Fatty Matters, to render them suitable for the Manufacture of Candles.*—Dated May 27, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists in acting on elaidine or elaidic acid (which is the substance formed by acting on fatty bodies with the gas formed by acting on nitric acid with an organic body,) with a variable proportion of sulphuric acid, according to the quality of the elaidine, thus producing fatty matters more suitable for making candles when distilled by steam at its natural temperature.

And in order that my said invention may be most fully understood, and readily carried into effect, I will proceed to describe the means employed by me. I take, for instance, 1,000 lbs. of the fatty body to be operated upon, and place it in a suitable vessel, so arranged as to prevent the escape into the air of the gas employed in the process, and should the fat to be operated upon be naturally solid, I here melt the same by means of steam or in any other convenient manner. When this is accomplished, I cause nitrous acid gas to pass through the fluid fat during about three hours; and I usually obtain the nitrous acid gas by the decomposition of nitric acid by means of an organic body, such as saw-dust, but other means of generating the nitrous acid may be employed; and I have found that the gas produced by the action of one pound of saw-dust on three pounds of nitric acid will be sufficient to produce the change required in 1,000 lbs. of fat or oil. When this process is complete, the fatty body, if originally neutral, as, for instance, tallow, will have been converted into the substance ordinarily known as elaidine. But should the substance operated upon have been originally acid, as, for instance, oleic acid, the result of the process will be the formation of elaidic acid. In either case, I wash the transformed fatty matter in water, until every trace of acid is removed, and I then raise the fat to a heat sufficient to dry the same. When in state, I add, for every 1,000 lbs. of fatty matter, from 100 lbs. to 170 lbs. of sulphuric acid, of a density of sixty-six degrees Beaumé, according to the nature of the fatty body

to be treated, the fats which have the lowest melting-points requiring the largest proportion of acid. Thus a little experience will soon teach the workman the quantity of acid which is necessary to produce the best effect. I allow this acid to trickle gradually during eight hours into the fat, which should be kept in a gently-heated state, and, after all the acid has been introduced, the temperature should be raised to about 230 degrees, the whole operation occupying about sixteen hours; after which I allow the black matter, which is formed by the action of the acid, to settle, and I draw off the clear fat, after which I wash the product until all trace of acid is removed, and I then proceed to dry by heat as before. This substance, after it has been distilled in a still heated by any of the well-known means, and from which the air is excluded by means of steam or otherwise, is very suitable for the manufacture of candles. I would mention that I believe this process to be applicable to all fats and oils of an animal or vegetable origin, whether neutral or acid, which require or are improved by being rendered harder and less easily fusible for the purpose of the manufacture of candles. I would also mention that I sometimes mix with the more fluid oils, before the commencement of the process, a certain quantity of resin, to obtain a harder product. But I do not find it to be advantageous to exceed the proportions of three parts of resin to five of oil, and in such a case I employ only five per cent. of sulphuric acid for the acidification.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I do not claim the conversion of fatty matters into elaidine and elaidic acid by means of nitrous acid.

But what I claim is, the acting on elaidine or elaidic acid, by whatever means the same may be obtained, by means of sulphuric acid.—In witness, &c.

ARISTIDE MICHEL SERVAN.

Specification of the Patent granted to SAMUEL CUNLIFFE LISTER, *of Bradford, in the County of York, Manufacturer, for Improvements in Machinery used in Washing Wool.*—Dated March 8, 1853.

To all to whom these presents shall come, &c., &c.—It is now the usual practice for the washer to lift the wool out of the washing-bowl or vessel, and to place it upon a travelling apron or sheet, which delivers it to the expressing rollers. Now I cause the sheet or apron to go to the bottom, or nearly so, of the bowl or vessel, which will enable the washer to place the wool on to the sheet or apron to be carried forward to the rollers with much greater ease; and my improvements also consist in covering washing rollers with vulcanized caoutchouc, instead of with wool, which is now the usual mode, and which is very troublesome and costly, as it only lasts a very short time, and requires to be constantly renewed.

I will now proceed more particularly to describe my invention. As will be readily understood, the wool, when immersed in the water, requires considerable labour to lift it from the liquid and to place it upon the sheet, which is usually fixed about one foot above the level of the water in the bowl. In order to lessen the labour attendant upon raising it out of the water, I fix the roller round which the endless sheet moves below, instead of above, the surface of the water; and, to prevent the wool from slipping off the sheet, I fasten thin laths of wood a few inches apart across the sheet, which will be found materially to aid in carrying it to the expressing rollers. All that is then required of the washer is to push the wool forward on to the sheet, and as it moves along it will conduct the wool on its surface to the expressing rollers, thus saving all the labour of lifting it out of the water.

I also find it a great improvement to cover washing rollers with vulcanized caoutchouc. In order to do so with advantage, it must be made as hard as possible, nearly like wood; unless this be attended to, it will not be found to answer. It should be made into rings or washers of about one foot in diameter, and two inches broad, and about half an inch thick, and placed upon an iron boss or roller, and then several of these rings should be pressed together as close as

possible, the number depending upon the width of the
required. The plan which I adopt, and which I f
answer well, for pressing the caoutchouc rings toget
to have a rim or flanch, about half an inch deep at one
the roller, and then at the other end I cut screw-t
and, as the nut is made to correspond with the flanch
other end, I can, by means of the screw, ri
caoutchouc as close as may be required. But I woul
it understood that I do not confine myself to the par
mode described of covering expressing rollers
caoutchouc, as it may be varied.—In witness, &c.

SAMUEL CUNLIFFE LIS

Specification of a Patent granted to ROBERT GALLOW
*Cartmell, in the County of Lancaster, for Improveme
the Manufacturing and Refining Sugar.*—Dated Ju
1853.

To all to whom these presents shall come, &c.,
This improvement in the manufacture of sugar consi
employing tannic acid (usually called tannin) or gallic
or a compound of one of these acids with a base as p
or ammonia, in conjunction with the acetates of lead.

The process for deficating cane and beet juice is
ducted in the following manner:—

After having added to the juice saccharate of
saccharate of lead, or saccharate of magnesia or plu
of lime, and afterwards neutral acetate, or one of the
acetates of lead, according to the means described i
former specification, I add, either before filtration to
the liquid from the precipitate produced by these neut
ing and deficating agents, or after filtration, a soluti
tannic or gallic acid, or some tannate or gallate in
quantity as to precipitate as much of the soluble lead
remaining in solution) as these agents can precipitate.
ascertain when sufficient has been added, a small qu
of the deficated juice must be filtered through paper
each addition of the precipitating agent, and a few dr
the precipitating agent added to this filtered juice; as
as the precipitating agent produces only a very slight
cipitate in the filtered trial quantity of the solution,

cient of the precipitating agent has been added. The juice must then be filtered to free it from the precipitate, and to the filtrate must be added a sufficient quantity of sulphurous acid, or some bisulphite, to remove the last traces of lead as is now well understood, and as is directed in the specification of Dr. Scoffern's patent. The juice must be again filtered to free it from the insoluble sulphite of lead thus produced. The process for sugar-refining is conducted in the following manner:—The raw sugar having been "blown up," and saccharate of lime, saccharate of magnesia, or saccharate of lead, or plumbite of lime, and afterwards neutral acetate, or one of the basic acetates of lead added according to the means described in my former specification, I add either before freeing the sugar solution (by filtration) from the precipitate produced by these agents, or after, a solution of tannic or gallic acid, or some tannate or gallate, until all the lead these agents are capable of precipitating has been thrown down. To ascertain when this point is arrived at, a small quantity of the sugar solution must be filtered through paper after each addition of the precipitating agent, and a few drops of the precipitating agent added to this filtered solution when the precipitating agent produces only a slight precipitate in a trial quantity of the solution. A sufficient quantity of the precipitating agent has been added. The solution must then be filtered to free it from the precipitate thus produced, and to the filtrate must be added a sufficient quantity of sulphurous acid, or some bisulphite to remove the last traces of lead as before described. The sugar solution must be again filtered to free it from the insoluble sulphite of lead thus produced. The solution of tannic acid is prepared by infusing two pounds of crushed valonia in from two to three gallons of boiling water and using the clear liquor; but it may be prepared from other substances. Gallic acid is prepared by exposing a solution of tannic acid to the air for some time.—In witness, &c.

ROBERT GALLOWAY.

PATENT LAW AMENDMENT ACT, 1852.

Third Set of Rules and Regulations under the Act 15 *&* 16 *Vict., c.* 83, *for the passing of Letters Patent for Inventions, and under the Act of the* 16 *&* 17 *Vict., c.* 115.

By the Right Honourable Robert Monsey Lord Cranworth Lord High Chancellor of Great Britain, the Right Honourable Sir John Romilly Master of the Rolls, Sir Alexander James Edmund Cockburn Her Majesty's Attorney-General, and Sir Richard Bethell Her Majesty's Solicitor-General, being four of the Commissioners of Patents for Inventions under the said Act of the 15 & 16 Vict., c. 83.

It is ordered as follows:—

Rule VII. of the Second Set of Rules and Regulations of the Commissioners, dated the 15th October, 1852, is hereby rescinded.

I. Every application for Letters Patent, and every title of invention and provisional specification, must be limited to one invention only, and no provisional protection will be allowed or warrant granted where the title or the provisional specification embraces more than one invention.

II. The title of the invention must point out distinctly and specifically the nature and object of the invention.

III. The copy of the specification, or complete specification, directed by the Act 16 & 17 Vict., c. 115, sect. 3, to be left at the office of the Commissioners on filing the specification or complete specification, shall be written upon sheets of brief or foolscap paper, briefwise, and upon one side only of each sheet. The extra copy of drawings, if any, left with the same, must be made as heretofore, and according to the directions contained in Rule III. of the Lord Chancellor, dated the 1st October, 1852.

IV. The copy of the provisional specification to be left at the office of the Commissioners on depositing the same shall be written upon sheets of brief or foolscap paper, briefwise, and upon one side only of each sheet. The extra copy of drawings, if any, left with the same, must be made

as heretofore, and according to the directions contained in Rule II. of the Commissioners, dated the 1st of October, 1852.

V. All specifications, copies of specifications, provisional specifications, petitions, notices, and other documents left at the office of the Commissioners, and the signatures of the petitioners or agents thereto, must be written in a large and legible hand.

VI. In the case of all petitions for Letters Patent left at the office of the Commissioners after the 31st day of December, 1853, the notice of the applicant of his intention to proceed for Letters Patent for his invention shall be left at the office of the Commissioners eight weeks at the least before the expiration of the term of provisional protection thereon, and no notice to proceed shall be received unless the same shall have been left in the office eight weeks at the least before the expiration of such provisional protection; and the application for the warrant of the Law Officer and for the Letters Patent must be made at the office of the Commissioners twelve clear days at the least before the expiration of the term of provisional protection, and no Warrant or Letters Patent shall be prepared unless such application shall have been made twelve clear days at the least before the expiration of such provisional protection: Provided always, that the Lord Chancellor may, in either of the above cases, upon special circumstances, allow a further extension of time, on being satisfied that the same has become necessary by accident, and not from the neglect or wilful default of the applicant or his agent.

(Signed) CRANWORTH, C.
JOHN ROMILLY, M.R.
A. E. COCKBURN, A.G.
RICHARD BETHELL, S.G.

Dated the 12th of December, 1853.

SCIENTIFIC MISCELLANEA.

RESEARCHES ON EVAPORATION.

BY PROFESSOR MARCET, OF GENEVA.

THE following experiments were instituted with the view of throwing some light on the tendency of certain circum-

stances to promote or diminish the evaporation of li
Water and alcohol were the liquids chiefly used.
results obtained by the author may be recapitulated
lows :—

1. The temperature of a liquid, allowed to eva
freely in an open vessel, is always inferior to that
surrounding atmosphere. The higher the temperat
the atmosphere, the greater is the difference betwe
temperature and that of the liquid exposed to evapo
Between 40° and 50° Centigrade the difference was fo
vary from 5° to 7°; between 20° and 25° it varied fr
to 1°¼; at 12° it was 0°·8 only, and between 3° an
about 0°2. The explanation of this result is obvious
evaporation of a liquid diminishing with the externa
perature, the cold, which is the consequence of this
ration, must diminish in the same proportion; an
were possible to prevent evaporation altogether, the
presumes that there would be no difference whatev
tween the temperature of a liquid and that of the
rounding medium.

2. The temperature of liquids, such as water and al
as well as the rapidity with which they evaporate, vari
other circumstances remaining the same, according
nature of the vessel in which these liquids are cont
For instance, the temperature of the surrounding a
phere being from 15° to 20°, water is on the averag
warmer in an open metallic vessel than in a similar
polished porcelain, and 0°2 warmer than in a similar
glass. It is the same with alcohol. Again, both
and alcohol evaporate more rapidly from a porcelain
than from a metallic or glass vessel of precisely the
size. For example: three similar vessels, one of
the second of porcelain, and the third of glass, conta
each 600 grains of water, having been exposed to eva
tion during seven days, the temperature of the surrou
atmosphere varying from 20° to 25°, it was found, t
the end of that time the porcelain vessel had lost
grains of its previous weight, the metallic one 277, a
glass vessel 275·5 grains only. The author enters
considerable detail as to the precautions he took to
sure that these differences could not be attributed t
difference in the radiating or conducting powers of th
sels employed.

The differences observed in the temperature of li

according to the nature of the vessels in which they are contained, depends, no doubt, on the property with which these vessels appear to be endowed, of accelerating or delaying evaporation. It is evident that in each case the quantity of sensible heat subtracted from the liquid, or, in other words, the diminution of its temperature, must be in proportion to the quantity of vapour formed. For instance, the fact that water and alcohol are constantly colder in a porcelain vessel than in a similar vessel of metal or glass, is the natural result of the more rapid evaporation of these liquids from the former of these vessels than from the two latter. The reason why a porcelain vessel evaporates more freely than a metallic or glass one is far less evident. The author has proved, by placing a hermetically-closed bottle of porcelain containing water under the vacuum of the air-pump, that it cannot be owing to any perviousness of the sides of the vessel, as he was at first inclined to suspect.

3. The influence of the mass or depth of a liquid was next examined. The author's experiments appear to lead to the curious fact, that the rapidity with which any given liquid evaporates depends not only on the extent of its surface, but also, within certain limits, on its depth. He found, for instance, that with two similar cylindrical porcelain vessels, containing, the first a layer of water of one-twelfth of an inch in depth, and the second a layer of half an inch, the evaporation from the latter exceeded that of the former in the proportion of nearly 4 to 3. A similar result was obtained with alcohol. If thin glass vessels were used, the same increase of depth accelerated the evaporation in the proportion of 6 to 5. As the author himself observes, this apparent influence of the depth of a liquid on its evaporation, may very possibly be merely owing to the greater facility with which the different layers are conveyed one after the other to the surface, when the liquid is of a certain depth than when it is quite shallow.

4. Water containing a solution of salt in about the same proportion of sea-water, evaporates less rapidly, and consequently produces less cold than the same quantity of distilled water. The higher the temperature of the surrounding atmosphere, the greater the difference between the quantities of salt and fresh water evaporated in a given time under similar circumstances.

5. A given quantity of water, mixed with certain pul-

verulent substances, such as siliceous sand, for the particles of which it has but a slight adhesion, evaporates more rapidly than the same quantity of distilled water *alone*. The fact was ascertained in the following manner:—The author, having procured two small porcelain vessels, exactly of the same size, introduced into one of them 300 grains of distilled water, and into the other a small quantity of siliceous sand, over which 300 grains of water were poured, so as not only to saturate the sand, but also to leave a layer of water of about one-tenth of an inch in thickness over and above its surface. At the end of five days, it was observed that the water standing alone had lost 184 grains of its previous weight, while the water mixed with the sand had lost no less than 196 grains. The average difference, resulting from a series of experiments, was $7\frac{1}{2}$ per cent. in favour of the more rapid evaporation of water mixed with sand compared with that of water standing alone. If the experiment be made with glass or metallic vessels, the difference is only about $4\frac{1}{2}$ per cent.

6. The last result which we shall mention, and which may be regarded as a direct consequence of the preceding one, is the following:—Water mixed with sand remains habitually at a slightly lower temperature than an equal surface of water standing alone. The difference varies to a certain extent, according to the nature of the vessels in which the experiment is performed, never, however, exceeding half a degree centigrade. It is greater, when the comparison is made between water and wet sand placed in two similar metallic vessels, than when they are placed in porcelain or glass vessels; in the latter case it seldom exceeds $0°{\cdot}1$ to $0°{\cdot}2$.

The author concludes by remarking, that the foregoing result tends to confirm an opinion expressed some time since by Professor De la Rive, in a letter to M. Arago, published in the *Comptes Rendus de l'Académie des Sciences* for October, 1851. In this letter, M. De la Rive attributes the sudden appearance of vast glaciers in divers parts of Europe to a temporary refrigeration produced at the period of the elevation of the most recent European strata, by the evaporation of the water with which they were previously covered. If, as the author's experiments tend to show, evaporation takes place more rapidly from water mixed with sand, earth, or any similar substance, than from a surface of clear water, it becomes natural to conclude, that

the cold produced by evaporation from the recently-elevated and still humid strata, must have been greater than that resulting from the evaporation of the sea or freshwater lake which covered them previously to a great depth.—*Bibliothèque Universelle*, April, 1853.

ANALYSIS OF AURIFEROUS QUARTZ.

BY A. B. NORTHCOTE, ASSISTANT AT THE ROYAL COLLEGE OF CHEMISTRY.

THE specimen, the analysis of which is detailed below, was consigned to England by an Australian merchant, among many other pieces which came to him in the way of business, and nothing unfortunately is therefore known respecting its origin.

Its aspect was decidedly waterworn, and, as regarded the quantity of precious metal present, not at the first glance very promising. Quartz was the predominating feature, with small nodular masses of gold dispersed here and there over the surface. On breaking the lump, however, a very different appearance presented itself; these masses were found to extend inwards, and, assuming the character of veins, to run rather extensively throughout the mineral; and so much richer did it prove than was expected, that the gold separated constituted about half the weight of the original specimen. The whole of the gold existing in it was contained in these large veins, there being no finely-divided particles disseminated through the substance of the associated bodies.

The matrix consisted almost entirely of quartz, with a little carbonate of lime and a trace of alumina; but probably the true matrix was quartz alone, the other matters being merely lodgments in the crevices of the rock—impurities contracted at some period subsequent to its formation.

The analysis of the contained metal, conducted in the ordinary way, the gold being reduced by means of oxalic acid, gave the following result in 100 parts:—

Gold	99·283
Silver	·437
Iron	·203
Copper	·069
Bismuth	·008
	100·000

PATENTS SEALED TO DECEMBER 19, 1853.

1222. JOHN HASKETT, of Wigmore-street, in the county of Middlesex, for Improvements in anchors to be called the "Ferdinand Martin Safety Anchor."—Dated May 18, 1853. Sealed November 18, 1853.—(A communication.)

1224. WHARTON RYE, of Collyhurst, near Manchester, Iron-founder, for Certain improvements in kitchen ranges.—Dated May 18, 1853. Sealed November 18, 1853.

1227. JOHN RYAN, of Liverpool-street, in the city of London, Surgeon, for An apparatus for purifying liquids in a ready and economical manner.—Dated May 18, 1853. Sealed November 18, 1853.

1231. GEORGE SANT, of Norton Lodge, Mumbles, Swansea, for Improvements in clocks or timekeepers.—Dated May 18, 1853. Sealed November 18, 1853.

1327. JOHN MACDONALD, of Henry-street, Upper Kennington-lane, Vauxhall, in the county of Surrey, Machinist, for Improvements in and applicable to lamps, also applicable to apparatus for lighthouse signal purposes, part of the invention applicable for other useful purposes.—Dated May 31, 1853. Sealed November 18, 1853.

1601, JOHN FALL, of Chorlton-upon-Medlock, in the city of Manchester, Gentleman, for Improvements in the treatment of certain oils.—Dated July 5, 1853. Sealed November 18, 1853.

1865. DAVID MUSHET, of Coleford, in the county of Gloucester, Gentleman, and EDWIN WHITE, of Shiffnal, in the county of Salop, Engineer, for Improvements in steam-vessels or other vessels.—Dated August 10, 1853. Sealed November 18, 1853.

2064. JAMES GASCOIGNE LYNDE, junior, of Great George-street, Westminster, Civil Engineer, for a pressure governor or self-acting apparatus for regulating the flow of water.—Dated September 8, 1853. Sealed November 18, 1853.

2124. RICHARD LAMING, of Millwall, Poplar, Chemist, for An improved process for purify gas.—Dated September 13, 1853. Sealed November 18, 1853.

2150. JOHN BARSHAM, of Kingston-upon-Thames, for Improvements in the manufacture of bricks, tiles, and blocks.—Dated September 15, 1853. Sealed November 18, 1853.

2186. GEORGE PEABODY, of Warnford-court, in the city of London, Merchant, for Improved machinery for dressing and warping yarns.—Dated September 21, 1853. Sealed November 18, 1853.—(A communication.)

1239. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improved machinery or apparatus applicable for pumping water and supplying steam boilers with water and maintaining the water therein at a proper level.—Dated May 19, 1853. Sealed November 19, 1853.—(A communication.)

1244. WILLIAM FULTON, of Paisley, Bleacher, for Improvements in the treatment and scouring or cleansing of textile fabrics.—Dated May 19, 1853. Sealed November 19, 1853.

1246. SAINT THOMAS BAKER, of King's-road, Chelsea, Gas Engineer, for Improvements in revolving shutters.—Dated May 20, 1853. Sealed November 19, 1853.

1251. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, Middlesex, for Improvements in rotary engines to be driven by steam or any vapour fluid or gas, and in boilers or generators to be used in generating steam or gas for driving the aforesaid or other engines, or for other purposes.—Dated May 20, 1853. Sealed November 19, 1853.—(A communication.)

1252. THOMAS ISAAC DIMSDALE, of King's Town, near Dublin, Esquire, for Improvements in purifying coal gas, and in disinfecting sewage or other fœtid matters, and in absorbing noxious gaseous exhalations.—Dated May 20, 1853. Sealed November 19, 1853.

1254. WILLIAM CARR THORNTON, of Cleckheaton, York, Machine Maker, for Improved machinery for making wire cards.—Dated May 20, 1853. Sealed November 19, 1853.

1260. HENRI JOSEPH SCOUTETTEN, of Metz, France, for An improved plastic compound applicable to various ornamental and useful purposes.—Dated May 21, 1853. Sealed November 21, 1853.

1262. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, Middlesex, for Improvements in navigable vessels to be employed in all waters and to be propelled or impelled by sails, steam power, or other means.—Dated May 21, 1853. Sealed November 21, 1853.—(A communication.)

1269. THOMAS SINGLETON, of Over Darwen, Lancaster, Hat and Cap Dealer, for Improvements in looms.—Dated May 26, 1853. Sealed November 21, 1853.

1945. JOHN WEBSTER COCHRAN, of Gower-street, London, for Improvements in machinery for crushing, grinding, and pulverizing stone-quartz or other substances.—Dated August 20, 1853. Sealed November 21, 1853.

1267. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, for An improved method of treating flax and hemp, whereby they are brought to such a state that they may be carded, spun, and woven by machinery, such as is now employed in the manufacture of cotton and wool into yarn and cloth.—Dated May 25, 1853. Sealed November 23, 1853.—(A communication.)

1269. JOHN HARCOURT BROWNE, of Arthur's Seat, Aberdeen, for Improvements in apparatus for bottling or supplying vessels with fluids.—Dated May 23, 1853. Sealed November 23, 1853.

1271. HENRY TURNER, of Wilson-street, Limehouse, Engineer, for A new mode of applying hydraulic power to windlasses for weighing anchors and lifting heavy weights.—Dated May 23, 1853. Sealed November 23, 1853.

1276. WILLIAM BABB, of Gray's-inn-road, Saint Pancras, in the county of Middlesex, Gentleman, for Improvements in the manufacture of hats, caps, and bonnets.—Dated May 25, 1853. Sealed November 23, 1853.

1286. ALEXANDER PORECKY, of Bishopsgate-street Within, in the city of London, Gentleman, for Improvements in the manufacture of umbrellas and parasols.—Dated May 26, 1853. Sealed November 23, 1853.

1292. ILLINGWORTH BUTTERFIELD, of Bradford, York, Manager,

for Improvements in and applicable to looms for weaving.—Dated May 28, 1853. Sealed November 23, 1853.

1313. EBENEZER NASH, of Duke-street, Lambeth, Tallow Chandler, and JOSEPH NASH, of Thames-parade, Pimlico, Chemist, for Improvements in the manufacture of wicks.—Dated May 28, 1853. Sealed November 23, 1853.

1330. WILLIAM GREEN, of Islington, in the county of Middlesex, for Improvements in treating or preparing yarns or threads.—Dated May 30, 1853. Sealed November 23, 1853.

1332. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in fire-arms.—Dated May 30, 1853. Sealed November 23, 1853.—(A communication.)

1375. JOHN CHISHOLM, of Holloway, in the county of Middlesex, Practical Chemist, for Improvements in the production or manufacture of artificial manure.—Dated June 4, 1853. Sealed November 23, 1853.

1382. THOMAS RUSS NASH, of Leigh-street, in the county of Middlesex, Surveyor, for Improvements in filters.—Dated June 4, 1853. Sealed November 23, 1853.

1536. NOBLE CARR RICHARDSON, of South Shields, Founder, for Improvements in capstans.—Dated June 23, 1853. Sealed November 23, 1853.

1576. WILLIAM RICE, of Boston, in the county of Lincoln, Miller and Corn Merchant, for Improvements in harness for horses and other animals, and in the manufacture of springs for the same.—Dated June 30, 1853. Sealed November 23, 1853.

1618. HENRY BATE, of New Hampstead-road, Kentish-town, Surgeon, for A new fire-escape, which he denominates the "Ignevador."—Dated July 7, 1853. Sealed November 23, 1853.

1688. CHARLES GOODYEAR, of Avenue-road, St. John's Wood, in the county of Middlesex, for Improvements in spreading or applying india-rubber or compositions of india-rubber on fabrics.—Dated July 15, 1853. Sealed November 23, 1853.

1690. CHARLES GOODYEAR, of Avenue-road, St. John's Wood, in the county of Middlesex, for Improvements in the manufacture of brushes and substitutes for bristles.—Dated July 15, 1853. Sealed November 23, 1853.

1731. THOMAS GRAY, of Newcastle, Tobacco Manufacturer, and JOHN REID, Engineer, of the same place, for An improved mode of manufacturing files and rasps.—Dated July 22, 1853. Sealed November 23, 1853.

1772. BENJAMIN COLLINS BRODIE, junior, of Albert-road, Regent's-park, in the county of Middlesex, for Improvements in treating or preparing black-lead.—Dated July 28, 1853. Sealed November 23, 1853.

2026. JOHN MACINTOSH, of Pall-mall, Naval Engineer, for Improvements in breakwaters.—Dated September 1, 1853. Sealed November 23, 1853.

2079. ISAAC LOWTHIAN BELL, of the Washington Chemical Works, Newcastle-upon-Tyne, for Improvements in the manufacture of sulphuric acid.—Dated September 9, 1853. Sealed November 23, 1853.

2094. EDMUND LEYLAND, of St. Helen's, in the county of Lancaster, Builder, for Improvements in apparatus for the manufacture of

sulphuric acid.—Dated September 10, 1853. Sealed November 23, 1853.

2208. JAMES SMITH, of Law Hill, in the county of Perth, Veterinary Surgeon, for Improvements in scythes.—Dated September 26, 1853. Sealed November 23, 1853.

2229. JOHN PHILIPS, of Birmingham, Manufacturer, for Improvements in shaping metals.—Dated September 29, 1853. Sealed November 23, 1853.

1276. WILLIAM BABB, of Gray's Inn-road, in the county of Middlesex, for Improvements in the manufacture of hats, caps, and bonnets.—Dated May 25, 1853. Sealed November 25, 1853.

1278. GEORGE IBLAM HIGGINSON, of Meeting-house-lane, Mary's Abbey, Dublin, Sugar Refiner, for Improvements in machinery or apparatus for evaporating or concentrating liquids.—Dated May 27, 1853. Sealed November 25, 1853.

1279. FREDERICK RUSSELL, of Clarence-gardens, Regent's-park, in the county of Middlesex, Mechanic, for Improvements in raising and lowering windows, shutters, blinds, and similar appendages.—Dated May 25, 1853. Sealed November 25, 1853.

1282. LOUIS AUGUSTUS DEVERTE, of Argenteuil, near Paris, for An improved machinery for combing wool.—Dated May 25, 1853. Sealed November 25, 1853.

1325. JOSEPH BROWN, Upholsterer, 71, Leadenhall-street, in the city of London, for Improvements in elastic spring beds, mattresses, cushions, and all kinds of spring stuffing for upholstery work, generally making them lighter and more portable.—Dated May 30, 1853. Sealed November 25, 1853.

1381. BENJAMIN BIRAM, of Wentworth, in the county of York, Gentleman, for Improvements in working and ventilating mines.—Dated June 4, 1853. Sealed November 25, 1853.

1513. PACIFIQUE GRIMAUD, of Paris, Gentleman, for A new æro-gaseous drink, which he calls "Grimaudine."—Dated June 20, 1853. Sealed November 25, 1853.

1525. CHARLES TOPHAM, of Hoxton, in the county of Middlesex, Engineer, for Improvements in apparatus for measuring liquids, gases, and other elastic fluids, and for regulating the flow thereof, which apparatus may also be applied to the obtaining of motive power.—Dated June 22, 1853. Sealed November 25, 1853.

1585. JOHN GETTY, of Liverpool, Merchant, for Certain improvements in ship-building.—Dated July 1, 1853. Sealed November 25, 1853.

2170. EDWARD THOMAS, of Belfast, Power Loom Factory Manager, for An improvement in the construction of looms for weaving.—Dated September 19, 1853. Sealed November 25, 1853.

2340. NICHOLAS CALLAN, of the Roman Catholic College, Maynooth, in the county of Kildare, for A means of protecting iron of every kind against the action of the weather, and of various corroding substances, so that iron thus protected will answer for roofing, cisterns, baths, gutters, pipes, window-frames, telegraphic wires for marine and various other purposes.—Dated October 12, 1853. Sealed November 25, 1853.

1312. WILLIAM SMITH, of Salisbury-street, Adelphi, London, Civil Engineer, for Certain improvements in the machinery for and method of making and laying down submarine and other telegraph cables,

which machinery is also applicable and is claimed for the making of ropes and cables generally.—Dated May 28, 1853. Sealed November 28, 1853.

1323. ALFRED WHALEY SANDERSON, of Cable-street, Lancaster, Tea, Coffee, and Spice Merchant, for Improvements in preparing effervescing powders.—Dated May 28, 1853. Sealed November 28, 1853.

1340. EDWARD WILKINS, of Queen's-road, Walworth, in the county of Surrey, Gentleman, for Improvements in pots and vessels for the growth and cultivation of plants.—Dated June 1, 1853. Sealed November 28, 1853.

1341. ALFRED HARDWICK, of Chatham-street, Liverpool, for Improvements in propelling vessels.—Dated June 1, 1853. Sealed November 28, 1853.

1350. JOSEPH WHITWORTH, of Manchester, Engineer, for Improvements in machinery for perforating or punching paper, card, and other materials.—Dated June 2, 1853. Sealed November 28, 1853.

1352. WILLIAM THOROLD, of Norwich, Civil Engineer, for Improvements in the construction of portable houses, and in machinery for raising, moving, and lowering the same.—Dated June 2, 1853. Sealed November 28, 1853.

1378. EDWARD BLACKETT BEAUMONT, of Wood Hall, Barnsley, in the county of York, Gentleman, for Certain improvements in bricks or tiles.—Dated June 4, 1853. Sealed November 28, 1853.

1406. HENRY BERNOULLI BARLOW, of Manchester, Consulting Engineer, for Improvements in machinery for spinning, doubling, and twisting cotton, and other fibrous substances.—Dated June 9, 1853. Sealed November 28, 1853.—(A communication.)

1493. JAMES WORRALL, Junior, of Salford, in the county of Lancaster, Dyer and Finisher, for Certain improvements in machinery or apparatus for washing, bleaching, and dying fustians, beaverteens, cantoons, sutteens, twills, and other textile fabrics.—Dated June 18, 1853. Sealed November 28, 1853.

1496. GEORGE ROBINSON, of Manchester, Tea and Coffee Merchant, for Certain improvements in apparatus for roasting and desiccating coffee, cocoa, and chicory.—Dated June 18, 1853. Sealed November 28, 1853.

1629. JACOB BRETT, of Hanover-square, in the county of Middlesex, for Improvements in photography.—Dated July 8, 1853. Sealed November 28, 1853.

1874. GEORGE DEARDS, of Harlow, in the county of Essex, for Improvements in lamps.—Dated August 11, 1853. Sealed November 28, 1853.

1962. THOMAS HERBERT, of Nottingham, Lace Manufacturer, and EDWARD WHITTAKER, of Nottingham, Mechanic, for Improvements in warp machinery employed in the manufacture of purled and other fabrics.—Dated August 23, 1853. Sealed November 28, 1853.

2087. ROBERT DREW, of Bath, Stay Manufacturer, and JOHN BAYLIS, of Birmingham, Rifle Implement Manufacturer, for Improvements in stay and other like fastenings.—Dated September 9, 1853. Sealed November 28, 1853.

2095. THOMAS WILLIAM GILBERT, of Limehouse, Sail-maker, for Improvements in sewing sails and other articles.—Dated September 10, 1853. Sealed November 28, 1853.

2117. ADOLPHUS SINGTON, of Manchester, Merchant, for Certain improvements in machinery, or apparatus for grinding or setting doctors used in calico and other similar printing machinery.—Dated September 13, 1853. Sealed November 28, 1853.—(A communication.)

2179. ARISTIDE MICHEL SERVAN, of Philpot-lane, in the city of London, for Improvements in distilling fatty and oily matters.—Dated September 20, 1853. Sealed November 28, 1853.

2218. ROBERT BRISCO, of Low Mill House, St. Bees, in the county of Cumberland, Esquire, and PETER SURRES HORSMAN, of St. John's, Beckermet, in the same county, Gentleman, for Certain improvements in the preparation of flax and other vegetable fibrous substances.—Dated September 27, 1853. Sealed November 28, 1853.

1337. HESKETH HUGHES and WILLIAM THOMAS DENHAM, both of Cottage-place, City-road, in the county of Middlesex, Engineers, for Improvements in pianofortes.—Dated May 31, 1853. Sealed November 30, 1853.

2219. MOSES POOLE, of Avenue-road, Regent's-park, in the county of Middlesex, Esquire, for Improvements in the manufacture of pulp for paper-makers.—Dated September 28, 1853. Sealed November 28, 1853.—(A communication.)

1356. HESKETH HUGHES and WILLIAM THOMAS DENHAM, both of Cottage-place, City-road, in the county of Middlesex, Manufacturers, for Improvements in machinery for weaving.—Dated June 2, 1853. Sealed November 30, 1853.

1439. JOSEPH H. PENNY and THOMAS B. ROGERS, of New York, America, for A new and useful improvement in the manner of constructing machinery for propelling vessels, and other machinery, which they term "a crank propeller."—Dated June 14, 1853. Sealed November 30, 1853.

1445. ARTHUR PARSEY, of Crescent-place, Burton-crescent, St. Pancras, Middlesex, for A revolving engine to be worked by steam, air, gases, or water.—Dated June 15, 1853. Sealed November 30, 1853.

1534. JOSHUA HORTON, of Brierly Hill, Stafford, Engineer and Boiler Manufacturer, for An improvement or improvements in steam-boilers.—Dated June 24, 1853. Sealed November 30, 1853.

1569. JOHN IMRAY, of Bridge-road, Lambeth, in the county of Surrey, Engineer, for Improvements in obtaining motive power.—Dated June 29, 1853. Sealed November 30, 1853.

1634. JAMES PARKES, of Birmingham, and SAMUEL HICKLING PARKES, of Birmingham aforesaid, Manufacturers and Copartners, for Improvements in the manufacture of certain drawing or mathematical instruments; also in packing or fitting the same in their cases, which said improvements in packing or fitting are also applicable to the packing or fitting of other articles.—Dated July 9, 1853. Sealed November 30, 1853.

1702. JAMES NAYLOR, of Hulme, near Manchester, Surveyor, for Improvements in lamps.—Dated July 16, 1853. Sealed November 30, 1853.

2110. ALFRED VINCENT NEWTON, of Chancery-lane, in the county of Middlesex, Mechanical Draughtsman, for Improved machinery for crushing and grinding mineral and other substances.—Dated September 12, 1853. Sealed November 30, 1853.—(A communication.)

2239. ROBERT BRISCO, of Low Mill House, St. Bees, Cumberland, Esquire, and PETER SURRES HORSMAN, of St. John's, Beckermet,

same county, Gentleman, for Certain improvements in machinery for heckling flax, hemp, china grass, and other fibrous substances.—Dated September 30, 1853. Sealed November 30, 1853.

2249. ISAAC AMBLER, of Manningham, near Bradford, in the county of York, for Improvements in preparing or combing wool, and other fibrous substances.—Dated October 1, 1853. Sealed November 30, 1853.

2287. HENRY GODDARD, of Castle-gate, Nottingham, Kitchen-range Manufacturer, for Improvements in stoves and kitchen-ranges.—Dated October 6, 1853. Sealed November 30, 1853.

2289. JOHN RUBERY, of Birmingham, for Improvements in the manufacture of umbrella and parasol furniture.—Dated October 6, 1853. Sealed November 30, 1853.—(A communication.)

2295. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, in the county of Middlesex, Gentleman, for Improvements in apparatus for compressing or rarifying air or other elastic fluids.—Dated October 7, 1853. Sealed November 30, 1853.—(A communication.)

2311. CHARLES MAY and JAMES SAMUEL, both of Great George-street, Westminster, Civil Engineers, for Improvements in joining the ends of the rails of railways.—Dated October 8, 1853. Sealed November 30, 1853.

1354. WILLIAM HAMMOND SMITH, of Gloucester-row, Walworth, in the county of Surrey, for Improvements in the manufacture of parchment.—Dated June 2, 1853. Sealed December 2, 1853.

1362. JEAN DURANDEAU, of Paris, General Manager, of the firm of Durandeau and Chauveau, for Certain means of obtaining marks and designs in paper.—Dated June 3, 1853. Sealed December 2, 1853.

1363. FERDINAND LOUIS GOSSART, of Paris, No. 52, Rue Montmartre, for A system of permanent circulation of caloric, intended to produce and overheat steam gas and liquid.—Dated June 3, 1853. Sealed December 2, 1853.

1365. JAMES SPOTSWOOD WILSON, of Tavistock-place, Russell-square, in the county of Middlesex, Civil Engineer, for A machine or apparatus for digging or raising earth, and applicable to agricultural or engineering purposes.—Dated June 3, 1853. Sealed December 2, 1853.

1369. JAMES HAYES, of Elton, in the county of Huntingdon, Iron-founder, for Improved machinery for raising and stacking straw, hay, corn, and other agricultural produce.—Dated June 3, 1853. Sealed December 2, 1853.

2113. ALFRED VINCENT NEWTON, of Chancery-lane, in the county of Middlesex, Mechanical Draughtsman, for Improved machinery for crushing and grinding mineral and other substances.—Dated September 12, 1853. Sealed December 2, 1853.—(A communication.)

2187. ALFRED VINCENT NEWTON, of Chancery-lane, in the county of Middlesex, Mechanical Draughtsman, for An improved method of forming seams and ornamental stitching, and in machinery for effecting such operation, part of which machinery is applicable to the forming of other seams and stitches.—Dated September 21, 1853. Sealed December 2, 1853.—(A communication.)

2225. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improved machinery for cutting metal or other substances.—Dated September 28, 1853. Sealed December 2, 1853.—(A communication.)

2251. ROBERT HALLIWELL, of Bolton-le-Moors, in the county of

Lancaster, Mechanic, and WILLIAM JOHNSON, of Farnworth, in the same county, Manager, for Improvements in machinery for spinning and doubling cotton, and other fibrous substances, and for grinding cards.—Dated October 1, 1853. Sealed December 2, 1853.

2261. PETER ROTHWELL JACKSON, of Salford, in the county of Lancaster, Engineer, for Improvements in machinery for manufacturing hoops and wheels.—Dated October 4, 1853. Sealed December 2, 1853.

2269. WILLIAM GOSSAGE, of Widnes, in the county of Lancaster, for Improvements in obtaining certain saline compounds from solutions containing such compounds.—Dated October 4, 1853. Sealed December 2, 1853.

1386. GEORGE CARTER, of Nottingham, in the county of Kent, Gentleman, and GEORGE MARRIOTT, of Hull, Colour Manufacturer, for Improvements in the manufacture of white lead.—Dated June 7, 1853. Sealed December 5, 1853.

1388. JOHN WALTER FRIEND, of Canute-road, Southampton, for An improved method of measuring and registering the distance run by ships and boats proceeding through the water, which is also applicable to measuring and registering tides and currents.—Dated June 6, 1853. Sealed December 5, 1853.

1396. FREDERICK LIPSCOMBE, of the Strand, in the county of Middlesex, Water Filter Manufacturer, for Improvements in the construction of ships and boats.—Dated June 7, 1853. Sealed December 5, 1853.

1399. ALEXANDER MCDOUGALL, of Manchester, Chemist, for Improvements in the manufacture of potash and soda ash.—Dated June 7, 1853. Sealed December 5, 1853.

1409. CLAUDE ARNOUX, of Paris, Gentleman, for A new system of towing and traction.—Dated June 9, 1853. Sealed December 5, 1853.

1413. EDWARD MANIERE, of Bedford-row, in the county of Middlesex, Gentleman, for Improvements in the manufacture of paper.—Dated June 9, 1853. Sealed December 5, 1853.

1431. THOMAS JAMES PARRY, of the Lozells, Aston juxta Birmingham, Engine-turner, for An improvement or improvements in raising and lowering Venetian and other blinds, applicable also to the raising and lowering of other bodies.—Dated June 13, 1853. Sealed December 5, 1853.

1459. EDWARD WALMSLEY, of Heaton Norris, in the county of Lancaster, Spinner, and JOHN HOLMES, of Manchester, Engineer, for Improvements in and applicable to steam-engines.—Dated June 16, 1853. Sealed December 5, 1853.

1515. CHARLES COWPER, of Southampton-buildings, Chancery-lane, in the county of Middlesex, for Improvements in the manufacture of cards, or substitutes for cards, for the Jacquard loom.—Dated June 21, 1853. Sealed December 5, 1853.—(A communication.)

1560. EDWARD DAVIES, of Gothenburg, Sweden, Manufacturer, for Improvements in machinery or apparatus for carding and otherwise preparing cotton or other fibrous materials to be spun, and also for cleaning or stripping cards used in the said operation.—Dated June 30, 1853. Sealed December 5, 1853.

1583. RICHARD BRADLEY and WILLIAM CRAVEN, of Westgate Common Foundry, in Wakefield, in the county of York, Engi-

neers and Iron-founders, for Improvements in the moulding, forming, and compressing of clay for the manufacture of bricks, tiles, and other earthenware—Dated July 1, 1853. Sealed December 5, 1853.

1603. ALFRED VINCENT NEWTON, of Chancery-lane, in the county of Middlesex, Mechanical Draughtsman, for Improved machinery for printing.—Dated July 5, 1853. Sealed December 5, 1853.—(A communication.)

1657. MARTIN SAMUELSON, of Hull, Engineer, for Improvements in the manufacture of bricks and other articles from plastic materials. —Dated July 12, 1853. Sealed December 5, 1853.

1949. ALEXANDER CUNNINGHAME, of Glasgow, Iron Master, for Improvements in the manufacture or production of alkalis and their salts or alkaline salts.—Dated August 20, 1853. Sealed December 5, 1853.

2126. JOHN WILSON, of Manchester, Calico Printer, for Improvements in and applicable to machines for printing fabrics.—Dated September 14, 1853. Sealed December 5, 1853.

2301. FRANCIS WHITEHEAD, of Crayford, in the county of Kent, Draughtsman, and WILLIAM WHITEHEAD, of the same place, Block Cutter, for Improvements applicable to lanterns, lamps, lamp shades, and reflectors for reflecting or concentrating or diffusing light.—Dated October 7, 1853. Sealed December 5, 1853.

2305. JOSEPH DENTON, of Prestwich, near Manchester, Mechanical Engineer, for Improvements in looms for weaving.—Dated October 8, 1853. Sealed December 5, 1853.

2313. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improvements in firearms and cartridges.—Dated October 8, 1853. Sealed December 5, 1853.—(A communication.)

2319. FREDERICK WARNER, of the Crescent, Jewin-street, City, and JOHN SHOTTON, Foreman in the employ of John Warner and Sons, for Improvements in the manufacture of large bells.—Dated October 10, 1853. Sealed December 5, 1853.

2359. ABRAHAM POPE, of Edgware-road, in the county of Middlesex, Engineer, for Improvements in furnaces.—Dated October 13, 1853. Sealed December 5, 1853.

2361. CHARLES LUDOVIC AUGUSTUS MEINIG, of Leadenhall-street, in the city of London, for Improvements in galvanic batteries.—Dated October 13, 1853. Sealed December 5, 1853.

2375. CHARLES COATES, of Sunnyside, near Rawtenstall, in the county of Lancaster, Mechanic, for Improvements in and applicable to weaving.—Dated October 15, 1853. Sealed December 5, 1853.

2377. BENJAMIN PRICE, of Fieldgate-street, Whitechapel, in the county of Middlesex, Furnace Builder, for Certain improvements in the means of, or apparatus for reducing the quantity of smoke from the furnaces of boilers, coppers, pans, and other like vessels.—Dated October 15, 1853. Sealed December 5, 1853.

2387. AUGUSTUS APPLEGATH, of Dartford, in the county of Kent, Printer, for Improvements in printing and embossing paper with a view to prevent forgery.—Dated October 15, 1853. Sealed December 5, 1853.

1402. FREDERICK LUDEWIG HAHN DANCHELL, of Elm-grove Villas, Acton Green, in the county of Middlesex, Engineer, and WILLIAM STARTIN, of Heathfield-terrace, Turnham-green, in the

same county, Engineer, for An improved mode of obtaining auriferous deposits from the beds of rivers and lakes, and from pits containing water.—Dated June 8, 1853. Sealed December 8, 1853.

1395. HENRY GEORGE ROWE, ALBERT GEORGE ANDREW, and WILLIAM HENRY ANDREW, of Sheffield, Cutlery Manufacturers, for Improvements in the mode of fastening the handles of table knives and forks.—Dated June 7, 1853. Sealed December 9, 1853.

1430. JOSEPH SPENCER, of Bilston, in the county of Stafford, Ironfounder and Engineer, for A new or improved cupelo.—Dated June 13, 1853. Sealed December 9, 1853.

1486. EDGAR BREFFIT, of Castleford, in the county of York, Glass Manufacturer, for Improvements in the manufacture of glass-house pots.—Dated June 18, 1853. Sealed December 9, 1853.

1816. JOHN MACINTOSH, of Pall Mall, in the county of Middlesex, for Improvements in the construction of bridges, viaducts, and other like structures.—Dated August 3, 1853. Sealed December 9, 1853.

1970. THOMAS HILL, of Glasgow, Modeller, and ALEXANDER THOMSON, of same place, Brick Builder, for Improvements in the manufacture of pipes or hollow articles from plastic materials.—Dated August 24, 1853. Sealed December 9, 1853.

2006. CHARLES GOODYEAR, of Avenue-road, St. John's Wood, in the county of Middlesex, for Improvements in the manufacture of waterproof fabrics.—Dated August 30, 1853. Sealed December 9, 1853.

2075. EDWIN LUMBY, of Halifax, Ironfounder, and ZACCHÆUS SUGDEN, of Halifax aforesaid, Tin Plate worker, for Improvements in needles or wires used in the manufacture of carpets, looped pile fabrics, and velvets.—Dated September 9, 1853. Sealed December 9, 1853.

2138. THOMAS SWINGLER, of Victoria Foundry, Litchchurch, in the county of Derby, for Improvements in the permanent way of railways.—Dated September 14, 1853. Sealed December 9, 1853.

2211. HENRY WINTER, of Castle-street, Holborn, London, for An improvement in trowsers to supersede the use of braces, which improvement is applicable to other articles of apparel.—Dated September 26, 1853. Sealed December 9, 1853.

2242. CHARLES COATES, of Sunnyside, near Rawtenstall, in the county of Lancaster, Mechanic, for Improvements in coupling pipes and other articles, and in apparatus connected therewith.—Dated October 1, 1853. Sealed December 9, 1853.

2264. JOHN NORTON, of Cork, Esquire, for Improvements in firing explosive compounds.—Dated October 4, 1853. Sealed December 9, 1853.

2288. WILLIAM GREVES, of the Caledonian Mills, New Wharf-road, Caledonian-road, in the county of Middlesex, for Improvements in the manufacture of bricks.—Dated October 6, 1853. Sealed December 9, 1853.

2310. HENRY RICHARDSON PLIMPTON, and JAMES LEONARD PLIMPTON, of Massachusetts, America, for A new and useful article of furniture to serve the purpose of a bedstead, a toilet table, or a wash stand, and a writing desk.—Dated October 8, 1853. Sealed December 9, 1853.

2318. HENRY CLAYTON, of the Atlas Works, Upper Park-place, Dorset-square, in the county of Middlesex, Machinist, for Improve-

ments in the manufacture of bricks and tiles.—Dated October 8, 1853. Sealed December 9, 1853.

2316. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall, Managing Director of Price's Patent Candle Company, for Improvements in treating wool and fabrics composed of wool.—Dated October 10, 1853. Sealed December 9, 1853.

2318. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall, Managing Director of Price's patent Candle Company, for Improvements in the manufacture of soap.—Dated October 10, 1853. Sealed December 9, 1853.

2334. WILLIAM HENRY MUNTZ, of Massachusetts, America, for A new and useful improvement in paddle wheels for navigable vessels.—Dated October 11, 1853. Sealed December 9, 1853.

2354. ROBERT POPPLE, of Beverley, in the county of York, Colour Manufacturer, and HENRY WOODHEAD, of Kingston-upon-Hull, Cotton Spinner, for Improvements in machinery for slubbing, roving, and spinning cotton and other fibrous substances.—Dated October 13, 1853. Sealed December 9, 1853.

2356. WILLIAM ROBINSON, of Manchester, Screw Boat Manufacturer, for Improvements in machinery or apparatus for manufacturing or forging iron or other metals into screw-bolts, nuts, rivets, pins, studs, or other similar articles.—Dated October 13, 1853. Sealed December 9, 1853.

2370. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improved machinery for preparing and combing wool—Dated October 14, 1853. Sealed December 9, 1853.—(A communication.)

2386. GEORGE LAURIE, of New York, America, Dentist, for Improvements in the manufacture of artificial teeth and gums.—Dated October 15, 1853. Sealed December 9, 1853.—(A communication.)

2394. SAMUEL CUNLIFFE LISTER, of Bradford, in the county of York, for Improvements in combing cotton and wool.—Dated October 17, 1853. Sealed December 9, 1853.

2396. AUGUSTUS APPLEGATH, of Dartford, in the county of Kent, Printer, for Improvements in letterpress printing machinery.—Dated October 17, 1853. Sealed December 9, 1853.

2412. GEORGE COLLIER, of Halifax, in the county of York, Mechanic, for Improvements in the manufacture of carpets and other fabrics.—Dated October 19, 1853. Sealed December 9, 1853.

2414. CHARLES BARRACLOUGH, of Halifax, in the county of York, Mechanic, for Improvements in the manufacture of carpets and other fabrics.—Dated October 19, 1853. Sealed December 9, 1853.

1408. ANTOINE POUÇON, of Marseilles, for Certain improvements in obtaining motive-power.—Dated June 9, 1853. Sealed December 9, 1853.

1410. WILLIAM MUIR, of Manchester, Engineer, for Improvements in turning lathes, a part of which improvements is applicable to other useful purposes.—Dated June 9, 1853. Sealed December 9, 1853.

1414. WILLIAM BROOKES, of Chancery-lane, in the county of Middlesex, for Improvements in treating fabrics suitable for floor-cloths, covers, and such like articles.—Dated June 9, 1853. Sealed December 9, 1853.—(A communication.)

1415. WILLIAM BROOKES, of Chancery-lane, in the county of Middlesex, for Improvements in the manufacture of boxes and other

hollow receptacles.—Dated June 9, 1853. Sealed December 9, 1853. —(A communication.)

1425. CHRISTOPHER BINKS, of Albert Villa, North Woolwich, in the county of Kent, for Improvements in dryers, and in preparing drying oils for oil paints, varnishes, and other uses.—Dated June 11, 1853. Sealed December 9, 1853.

1435. ROBERT HOPKINS, of Manchester, Mechanical Engineer, for Improvements in machinery or apparatus for cutting and shaping cork, wood, and other similar substances.—Dated June 13, 1853. Sealed December 9, 1853.

1501. ROBERT MIDGELY, of Northowram, Halifax, in the county of York, Worsted Spinner, for Improvements in preparing and finishing certain worsted yarns, and in apparatus employed therein.—Dated June 20, 1853. Sealed December 9, 1853.

1503. WILLIAM BOGGETT, of St. Martin's-lane, in the county of Middlesex, Gentleman, and GEORGE BROOKES PETTIT, of Lisle-street, in the same county, Gas Engineer, for Improvements in dioptric refractors.—Dated June 20, 1853. Sealed December 9, 1853.

1911. RICHARD ARCHIBALD BROOMAN, of Fleet-street, in the city of London, for A method of, and machinery for, reducing wool and other vegetable fibres to pulp, applicable to the manufacture of paper, pasteboard, millboard, papier maché, mouldings, and other like purposes.—Dated August 15, 1853. Sealed December 9, 1853.—(A communication.)

1428. WILLIAM SMITH, Manufacturer, of Sheffield, for Improvements in the mode of manufacturing metallic handles for knives and forks, backs for razors, bows for scissors, and the relative parts of such like instruments.—Dated June 13, 1853. Sealed December 12, 1853.

1429. JOHN MARSH, THEOPHILUS MARSH, JAMES MARSH, and WALTER MARSH, of Sheffield, in the county of York, Manufacturers, for An improved mode of fastening the handles of table knives and forks.—Dated June 13, 1853. Sealed December 12, 1853.

1457. TIMOLEON ZOE LOUIS MAUREL, of Paris, for Certain improvements in horological alarms.—Dated June 15, 1853. Sealed December 12, 1853.

1467. PETER ARMAND LECOMTE DE FONTAINEMOREAU, of South-street, Finsbury, for An improved process for preserving milk, and its application to several organic products and alimentary substances.—Dated June 16, 1853. Sealed December 12, 1853.—(A communication.)

1468. PETER ARMAND LECOMTE DE FONTAINEMOREAU, of South-street, Finsbury, for Improvements in the preparation of certain vegetable and alimentary substances.—Dated June 16, 1853. Sealed December 12, 1853.—(A communication.)

1489. JAMES HEGINBOTTOM and JOSEPH HEGINBOTTOM, both of Ovenden, Halifax, in the county of York, Cotton Spinners, for Improvements in spinning.—Dated June 18, 1853. Sealed December 12, 1853.

1502. HIRAM BARKER, of Manchester, Engineer and Tool-maker, and FRANCIS HOLT, of Manchester, Engineer, for Improvements in machinery and apparatus for grinding and turning metals.—Dated June 20, 1853. Sealed December 12, 1853.

1552. ROBERT HARLOW, of Stockport, in the county of Lancaster, Brassfounder, for Improvements in constructing and working valves

for baths, wash-stands, and other purposes.—Dated June 27 Sealed December 12, 1853.

1801. JOHN GRIFFITHS, of Stepaside, Saunderfoot, near Te the county of Pembroke, South Wales, Engineer, for Certain in ments in steam-engines.—Dated August 2, 1853. Sealed De 12, 1853.

1836. WILLIAM NEWTON, of Chancery-lane, in the cou Middlesex, Civil Engineer, for Improvements in the process of cast-iron with other metals, and the alloys of other metals.— August 5, 1853. Sealed December 12, 1853.—(A communicat

1850. THOMAS YOUNG HALL, of Newcastle-upon-Tyne, Coal- for Improvements in combining glass with other materials.— August 9, 1853. Sealed December 12, 1853.

1930. WILLIAM CURTAIN, of Retreat-place, Homerton, county of Middlesex, Carpet Designer, for Improved machin printing textile fabrics, oil-cloths, leather, paper-hangings, anc similar fabrics or materials.—Dated August 18, 1853. Sealed ber 12, 1853.

1975. CHARLES COLLYFORD BANKS, of Clapham, in the co Surrey, Brassfounder and Finisher, for Improvements in lubrica Dated August 24, 1853. Sealed December 12, 1853.

1993. SAMUEL TAYLOR, of King-street, Manchester, Barri Law, for Improvements in apparatus for generating and a carbonic acid gas.—Dated August 27, 1853. Sealed Decem 1853.

2234. HIRAM BERDAN, of Cornhill, in the city of London, machine for collecting, preserving, and thereby preventing the mercury in the process of amalgamating metals, and for the perfect and economical washing, separating, and amalgamat auriferous and other ores.—Dated September 29, 1853. December 12, 1853.

2254. JOHN WYNCOLL BAXTER, of Mistley, in the county of Ironmonger, for Certain improvements in ship-building.—Date ber 3, 1853. Sealed December 12, 1853.

2258. WILLIAM HENRY WILDING, of Chesterfield-street, county of Middlesex, Gentleman, for Improvements in pro machinery.—Dated October 3, 1853. Sealed December 12, 18

2262. WILLIAM PEACE, of Haigh, near Wigan, in the cou Lancaster, Mining Engineer, for Hewing and excavating coal, and other minerals, strata, and substances, by certain machine appliances thereto.—Dated October 4, 1853. Sealed Decemb 1853.

2322. JAMES KNOWLES, of Eagley Bank, near Bolton-le-Mo the county of Lancaster, Coal Proprietor, for Improvements i chinery for regulating the velocity of steam-engines and other power engines.—Dated October 11, 1853. Sealed December 12

2341. PATRICK CLARK and ALEXANDER CLARK, both of Gate- Lincoln's-inn-fields, in the county of Middlesex, Engineers, f provements in revolving shutters and other closures for portab other buildings.—Dated October 12, 1853. Sealed December 12

2348. CHARLES SCOTT JACKSON, of Cannon-street, City, f provements in preserving seeds, potatoes, and other roots.— October 12, 1853. Sealed December 12, 1853.

2362. THOMAS GRAHAME, of Hatton Hall, Wellingborough, in the county of Northampton, for Improvements in building ships and other vessels.—Dated October 13, 1853. Sealed December 12, 1853.

2393. ELLEN JONES, of Palace-street, Pimlico, in the county of Middlesex, Widow and Administratrix of William John Thomas Jones, of Palace-street, aforesaid, deceased, for Improvements in steam-engine governors.—Dated October 17, 1853. Sealed December 12, 1853.—(A communication.)

2426. JULIUS AUGUSTUS ROTH, of Philadelphia, America, Chemist, for Improvements in the bleaching and drying of fibres or fibrous materials, part of which improvements is applicable to the drying of woven and other textile manufactures.—Dated October 20, 1853. Sealed December 12, 1853.

2447. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, in the county of Middlesex, Gentleman, for Improvements in mills for grinding.—Dated October 22, 1853. Sealed December 12, 1853.—(A communication.)

2450. JAMES DENOON YOUNG, of Westminster, in the county of Middlesex, Engineer and Manufacturer, for Improvements in casting, —Dated October 24, 1853. Sealed December 12, 1853.

1437. WILLIAM G. CRAIG, of Newport, Monmouth, Engineer, for Improvements in axles-boxes, guides, and bearings of locomotive engines and carriages, parts of which improvements are applicable to the brushes and bearings of machinery.—Dated June 14, 1853. Sealed December 14, 1853.

1450. JOHN MACINTOSH, of Pall Mall East, in the county of Middlesex, Civil Engineer, for Improvements in the construction of portable boats or vessels and buoys.—Dated June 15, 1853. Sealed December 14, 1853.

1669. WILLIAM FRANCIS SNOWDEN, of Weymouth, in the county of Dorset, Mechanist, for An improved mangle.—Dated July 12, 1853. Sealed December 14, 1853.

2001. EDWARD PATRICK GRIBBON, of Dublin, Architect, for Improvements in window frames and sashes.—Dated August 29, 1853. Sealed December 14, 1853.

2133. CHARLES TOWNSEND HOOK, of Tovil House, Maidstone, in the county of Kent, for Improvements in the manufacture of pulp.—Dated September 14, 1853. Sealed December 14, 1853.

2352. HENRY WHITAKER BUTTERWORTH, of Philadelphia, America, for An improved supplemental reflux valve for steam engines.—Dated October 13, 1853. Sealed December 14, 1853.—(A communication.)

2417. THOMAS THOMPSON, of Much Park-street, Coventry, Engineer, for Improvements in machinery for weaving carpets, coach lace, and velvet.—Dated October 19, 1853. Sealed December 14, 1853.

2421. WILLIAM RUSSELL, of Birmingham, Tube Drawer, for An improvement or improvements in the manufacture of copper tubes.—Dated October 20, 1853. Sealed December 14, 1853.

1446. THOMAS BUTTERWORTH, of Meanwood, in the county of York, Gentleman, for A machine for ploughing land, harrowing and crushing clods at one operation.—Dated June 15, 1853. Sealed December 15, 1853.

1449. CHARLES WYE WILLIAMS, of Liverpool, Gentleman, for

Improvements in the manufacture of sheet iron and of iro used for boilers, vessels, buildings, and other like purposes.- June 15, 1853. Sealed December 15, 1853.

1461. WILLIAM CHRISTOPHER, of Euston-square, and G GIDLEY, of Robert-street, Hoxton, for Improvements in abs sulphur and other matters from vulcanized Indian-rubber.- June 16, 1853. Sealed December 16, 1853.

1462. JOHN BLAIR, of New Milnes, Ayrshire, Cutter, for and improved mode of cutting lappet cloths or other similar —Dated June 16, 1853. Sealed December 16, 1853.

1464. JULES ALEXIS ADRIEN DUMOULIN, of Paris, for proved instrument for measuring and tracing.—Dated June 1 Sealed December 16, 1853.

1477. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castl Holborn, London, for An improved stove or kiln.—Dated J 1853. Sealed December 17, 1853.—(A communication.)

1478. ROBERT LISTER, of Scotswood, in the county of N berland, Brick-maker, for Improvements in chimney tops or Dated June 17, 1853. Sealed December 17, 1853.

1522. FREDERICK AYCKBOURN, of Guildford-street, Russell in the county of Middlesex, Patent Folding Boat Manufactu Improvements in the manufacture of waterproof fabrics.—Dat 22, 1853. Sealed December 19, 1853.

1530. THOMAS WEATHERBURN DODDS, of the Holmes Eng Railway Works, Rotherham, in the county of York, Engin Improvements in the manufacture of files, rasps, and other tools usually made of steel.—Dated June 23, 1853. Sealed ber 19, 1853.

1555. JOHN MASON, of Rochdale, in the county of La Machinist, and LUKE RYDER, of the same place, Mechanic, provements in machinery or apparatus for preparing and s cotton, and other fibrous substances.—Dated June 27, 1853. December 19, 1853.

1587. EDWARD CLARENCE SHEPARD, of Trafalgar-square, county of Middlesex, Gentleman, for Improvements in magne tric apparatus, suitable for the production of motive power and of light.—Dated July 1, 1853. Sealed December 19, 185 communication.)

1591. EDWARD CLARENCE SHEPARD, of Trafalgar-square, county of Middlesex, for Improvements in the manufacture —Dated July 2, 1853. Sealed December 19, 1853.—(A comm tion.)

1596. FRANCOIS MATHIEU DE AMEZAGA, of Bordeaux, Cap the Sardinian Navy, for A method of obtaining motive powe certain machinery or apparatus employed therein.—Dated 1853. Sealed December 19, 1853.

1715. JOHN ROBINSON, Coleman-street, City of London Throwster, for A new or improved apparatus for making te coffee, and other infusions or decoctions for chemical and othe poses.—Dated July 20, 1853. Sealed December 19, 1853.

1726. WILLIAM THORP, of Collyhurst, near Manchester, Bleacher, and Finisher, for Certain improvements in machin finishing and embossing plain and fancy woven fabrics.—Date 21, 1853. Sealed December 19, 1853.

THE

REPERTORY

OF

PATENT INVENTIONS.

No. 2. Vol. XXIII. ENLARGED SERIES.—FEBRUARY, 1854.

Specification of the Patent granted to Jacob Brett, *of Hanover-square, in the County of Middlesex, Gentleman, for Improvements in Electric Telegraph Apparatus.*—Dated May 11, 1853.—(Partly a communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The invention consists in the application of the force or power of air or gas to magnetic or electro-magnetic telegraphs, combined with magnetic or electro-magnetic apparatus escapements, for the purpose of giving more energy or force to the movement of the escapements, with a view to the more rapid working of such apparatus; when the apparatus consists of two parts, as in the printing telegraphic apparatus named in the specification of my former patent, videlicet, the composing machine and the printing machine, I apply an air piston and its connexions, to the printing apparatus, or to such apparatus as would be placed at a distant station where the message is to be received. It is not my intention to confine myself to the use of the ordinary air-pump for compressing the air to work the

valves which actuate the escapements, as for some
poses it may be found more convenient to use other
of attaining the same object, such as carbonic acid
other suitable gases, generated in suitable receivers, a
used therefrom as required, or ordinary organ bell
have found to answer the purpose well.

I will now describe a mode of applying atmospheric
to printing telegraphs having an ordinary air-pump
nected therewith.

Description of the Drawing marked A.

Fig. 1, is a plan.

Fig. 2, an elevation.

Fig. 3, is a longitudinal section of the coil, magnet
air valve.

Fig. 4, is a transverse section through the key-
shown, full size; and

Fig. 5, is a front elevation of parts not shown i
other figures drawn one-fourth of the real size.

The air-pump is mounted on a frame, *a*, *a*, whicl
supports an axis, *b*, and fly-wheel, *c*; on the axis, *b*
crank handle, *d*, by which the axis, *b*, may be turned
may be worked by a treadle; *f*, is a reservoir or re
having a pipe, f^1, leading to the top of the magneti
which is provided with a collar valve, *g*, which alter
connects the pipe, f^1, with the pipe, *h*, and with the
h^1, according as the circuit is made or broken; whe
circuit is made, the collar valve, *g*, is drawn by the
of the magnetic coil (hereinafter described) into the
tion shown in the section fig. 3, which opens a pa
from the pipe, f^1, into the pipe, *h*; but when the c
is broken, as hereafter described, the collar valve, *g*
be raised by the tension spring, *i*, which will make
nexion between the pipe, f^1, from reservoir, *f*, an
pipe or passage, h^1, so that the piston, *j*, will be
alternately in opposite directions in its cylinder, j^1,
current of air as often as the making and breaking o
tact takes place; on the piston, *j*, is formed a disc h
a grooved channel formed around it, into which the ta
of the pallet, *k*, enters, by means of which the pallet,
moved backwards and forwards on its centre in su
manner as to govern the movement of the ratch
escapement-wheel, *l*, shown in red in fig. 1. On the
b, of the air-pump is a bevilled-toothed pinion, b^1, t

into and driving another bevilled-toothed pinion, b^2, on the vertical axis, b^3; keyed on the axis, b^3, are four pulleys, b^4, b^5, b^6, b^7, differing in diameter according to the velocity required by the several parts driven by them. The pulley, b^4, gives motion to the type-wheel, m, and escapement-wheel, m^1, on the axis, m^2, by a band, m^3, passing around it, and around the pulley, m^4. The pulley, b^6, gives motion to the locking cam, n, on the axis, n^1, by a band, n^2, passing around it, and the pulley, n^3. The pulley, b^5, gives motion to the eccentric or printing cam, o, on the axis, o^1, by a band, o^2, passing around it, and a pulley, o^3.

The pulley, b^7, gives motion to the shaft or barrel, t, of the composing machine. a^1, a^1, are two metal plates placed horizontally, secured together by pillars, a^2, a^2, to form a framing; upon the top of the upper plate, a^1, is placed the type-wheel indicator or radial plate, m^5, and the eccentric cam, o, and lever, o^4, for performing the printing, and the apparatus for drawing forward the paper, p, and ink band, q. The letters and characters are placed upon the periphery of the type-wheel, m, and these letters correspond with those on the dial plate, m^5; upon the bottom or under side of the type-wheel, m, is placed the escapement-wheel, m^1, and another ratchet-wheel, m^4, is fixed to the upper side of the type-wheel, m, for discharging or giving motion to the printing part of the apparatus.

The pallets, k, are of the ordinary kind, and are the means of retarding and releasing the escapement-wheel, m^1, the tail piece, k^1, entering the groove formed in the piston by which it is driven, as already explained. The collar valve, g, which causes the air to enter alternately the tubes or passages, h, h^1, is formed on or affixed to the rod, g^1, which carries small discs of soft iron, g^2, g^2, (or an armature, as the case may be,) these are attracted by a series of electro-magnets fitted within a coil of insulated iron, so that the vibrations of the rod and armatures caused by a current of electricity passes through the coils of wire, and acting upon the electro-magnets gives motion to the collar valve suspended within the vertical cylinder by the distended wire, i, so that the collar valve, g, is drawn down upon making a circuit, and upon breaking circuit it is drawn up by the tension of the wire, i.

The cam, n, placed upon the axis, n^1, and driven by the band, n^2, is for regulating the printing; the axis, n^1, re-

volves in a contrary direction to the type-wheel. The being kept in place by the metal bar, a^3, held dov screws to the upper plate, a^2. The upper surface cam or disc, n, is slightly hollowed out and fitted washers of cloth, or some other suitable material to the printing, or to prevent the printing going on d the revolution of the type-wheel. On the edge o cam is a tooth or projection, n^4, always resting again flat surface of one of the teeth of the upper ratchet- by reason of its axis revolving in a reverse direction type-wheel, and consequently to the ratchet affixed th The cam, n, or lining cap, revolves loosely on the axi when the eccentric pin, o^*, is retarded or stopp coming against the stop, n^5, the pin, o^*, is adjustec a long and a short end, the eccentric rod, o^4, extend the front of the type-wheel, and connected to a bar, which is a small pillar or roller, o^5, fitted loosely on it roller, o^6, receives motion by the lever and clawl catch, o^9, o^{10}, which derive their movement from the tric, o, and parts connected therewith, shown by the rate plan of these parts. o^{11}, is a lever working c standard, o^{12}, fixed to the upper plate, a^2; withi standard, o^{13}, is a spiral or other spring which acts lever, o^{11}, in a manner to cause it to press again small pointed biting roller, o^6, formed or fixed o roller, o^8, the action of which is such as to cause the when placed between to be gripped or held thereby ciently to feed in as the printing goes on the lever, the part where the gripping takes place, is groov recessed, so as the better to hold the paper. The ink q, receives its motion by flat sides between the ro points on the biting roller, o^6. The movements ju scribed are so arranged as to take place on each sto of the type-wheel, such stoppage taking place o arrival of the letter to be printed at one of the sma surfaces on the pillar or roller, o^8. The printing place either by the making or the breaking of the c in the magnet; r, is a stop lever for arresting the pr train to enable the signals to be read without bei corded; s, is a lever and catch which acts on a pin under side of the type-wheel to bring it to zero whe sired. The ink or composition for colouring the ty upon the band, the band being saturated. The ban

the paper are pressed together upon the type, and the letter appears on the surface of the paper next to the ink band.

The compound magnet consists of a helix of small insulated wire, terminating in two poles or of several, videlicet, different, lengths of wire being selected applicable to various distances. The inside of the helix is fitted with a tube of metal which can be withdrawn at pleasure, and which contains the series of soft iron ferrules, *w*, *w*, &c., hereinbefore described at equal distances apart throughout the length of the tube, which becomes separately charged and magnetic during the passage of the current. Inside these rings, at corresponding distances, are placed on a brass rod a series of soft iron discs, q^2, slightly concave, and on the passage of a current through the coil of iron ferrules, *w*, *w*, fixed in the tube, attract the moveable discs to their surfaces, and thus is the rod moved to which they are attached. Upon the top of this rod is a small hook piece which hooks on to a fine steel wire, stretched across an elliptical frame and retained in a state of tension by two adjusting screws, one at either end of the frame; the object of the tension wire being, as hereinbefore stated, to regain the position of the rod after it has been drawn downwards by attraction.

There is also another adjusting screw to increase or decrease the tensions according to the variations of battery power. The pulley, b^1, gives motion to the shaft or barrel, *t*, by the band, t^1, passing around it and the pulley, t^2. On the barrel, *t*, are pins or projections, t^3, t^3, which, when the keys are severally depressed, stop the revolution of the barrel, *t*, by their projections or pins, t^4, t^4, on their undersides coming in contact with the projections, t^3, t^3, of the barrel, *t*. On the other end of the barrel, *t*, is a circuit wheel, which being of the well-known kind need not be described.

Description of the Drawing B.

I have shown in figures 1, 2, and 3, another mode of application to the air pistons in place of the before named air-pump, and friction bands and pulleys. I have adapted an ordinary train of wheels (similar to that explained in my patent of 1848). A, represents the type wheel, B, B, the escapement wheels, and C, a ratchet toothed lifting wheel, all upon the same axis, and D, the escapement pallets. E,

an armature, which is acted on by the magnet, F, for giving motion to the valve which regulates the currents of air to the drums with the wash-leather covers. G, tension spring for regulating the resistance suited to the magnetic force.

I, air tube or conductor connected with the air generator and air cylinder; 2, and 2 *a*, is the piston to the same; 3, pair of air drums faced with kid or other elastic material, to the centres of which is fastened the rod, 4, which gives motion to the escapement by means of the little ferrule, 5, this locks into a tail piece connected with the arbor of the escape pallets.

Figures 4, 4 *a*, and 4 *b*, represent a new adaptation to a key shaft of a key-board communicator. A, the shaft; B, driving pinion connected to the same; this pinion is fastened to a disc, C, which presses a friction spring, c^1, against it; and the shaft, D, a toothed wheel of 168 teeth, working into a pinion, *e*, of six teeth; and upon the axis of pinion, *e*, is a cam, *f*, for the purpose of giving motion to the lever, *g*, which has at its extremity contact-points of metal, *i*, for forming alternately a communication with the battery, and the bands of metal, *h*, *h*, either by reversing the poles or otherwise.

Description of Drawing C.

Sheet 3, figures 6 *a*, 6 *b*, represents that portion of the printing machine to which is applied a new mode for arresting and releasing the printing part of the train, by means of an electro-magnet. c^2, represents a toothed wheel on the same axis with the type wheel, having eighty-four teeth, which works in a pinion of six teeth, and on the axis of this pinion is a small cam or circuit conductor, c^3, for conducting the electricity from the battery to the band, d^2; and in figure, 6 *b*, the ratchet wheel, c^4, is applied for the purpose of conducting the electricity from the batteries to the band, d^2; this band is connected with one end of the wire of the magnet coil, F^1. The connexion being made with both poles of the battery, and both ends of the magnet coils, when the magnet is to act upon said armature, G^2, or that when the contact is made between the circuit cam and bands, d^2, the armature, G^2, fastened to the locking cam, L, is drawn towards the magnet, and thus acts upon the printing train. I have also applied the air piston to give motion to a type wheel, and another piston for printing the letters and signs without using either the ordinary train of wheels

or the rollers and bands, as before described, by causing the type wheel to be pushed forward by a step-by-step motion. And I propose to apply the power of the air piston to the ringing of alarm bells, and for discharging detents for acting upon railway signal apparatus; and to use an apparatus constructed on the principle of an ordinary organ bellows for generating the atmospheric air.

Description of Drawing D.

A, represents the type wheel; B, B, the escapement wheels; C, a ratchet tooth lifting wheel, all upon the same axis; D, the escapement pallets; d^1, lever, locking into the ferrule, e^1, for giving the motion to the escapement pallet, when the armature, E, (which is fastened in the same rod,) is attracted towards the electro-magnet; F, electro-magnet; *f*, adjusting piece and screw to regulate the tension spring, G, H; H^1, piston and hammer acted upon when the letters or characters are to be printed; I, roller for drawing the paper after each letter is printed to give space for the next; J, paper guide; K, locking lever, which retards or releases the locking cam, L, acting on the printing part of the train; *m*, lever connected with an eccentric on the same axis; this lever carries a clawing piece, *n*, for drawing round the clawing ratchet, *o*, on the axis of the paper roller; P, lever for arresting the type wheel at zero; *q*, stop lever for arresting the printing train, and so enable the signals to proceed without being recorded.

Having thus described the invention and the manner of performing the same, I wish it to be understood that what I claim is,

First, the application of compressed air or of chemical gases for the purposes enumerated.

Secondly, the application of friction-wheels with bands for giving motion to the telegraphic apparatus.

Thirdly, the arrangement of compound magnets, as above described, in connexion with a collar valve and cylinder.

Fourthly, the application of a double-headed piston in a cylinder, and in connexion with the escapement lever.

Fifthly, the arrangement of the tension spring for giving the recoil to the magnet armatures.

Sixthly, the application of air cylinder and piston for ringing of alarm bells, and for giving railway signals.—In witness, &c.

JACOB BRETT.

Specification of the Patent granted to FABIAN WREDE, *of Stockholm, in the Kingdom of Sweden, for Improvements in Gas and Air Engines.*— Dated July 11, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.— Under the denomination of gas engines I understand an engine which, for producing mechanical effect, employs the dilatation of permanent gases by heat, in accordance with the following not new principle, viz.:—One and the same mass of gas is moved backwards and forwards between two different rooms, in such a manner that it does not undergo any change in its volume through the transportation. During the transport from the one room to the other it is alternately heated and cooled, by which means its elasticity is alternately increased and diminished. The mass of gas in question is in constant communication with the one end of a common working cylinder, on whose piston it will consequently exercise an alternately stronger and weaker pressure, and cause it to move backwards and forwards in the same manner as in steam-engines.

The transport of the gas can be effected in two quite different manners, viz.:—either, A, by moving the gas from one part of a closed vessel to another, by means of a plunger which fills up a great part of its interior volume, or, B, by expelling the gas from a cylindrical or prismatical vessel, by means of a piston letting it pass freely through an exterior communication, either to the other end of the same vessel, that is to say, on the other side of the piston, or into another vessel whose piston moves in such a manner that the gas will not undergo any change in its volume through the transporting process.

The improvements which I have made in the gas engines refer principally to the latter of the above-mentioned methods of moving the gas, or that which is stated under B. In order to explain these improvements and show clearly the advantages gained by them, we must call to mind a distinguishing property in gases generally, that of being extremely bad conductors of heat. In consequence of this property it is evident that if a mass of heated gas could be moved into a vessel of a lower temperature in such a manner that no motion arose within the gas itself, then only

the exterior parts of the mass, or those which immediately touched the walls of the vessel, would be cooled by them, while, on the contrary, the rest of the mass would retain its higher temperature till the streams by degrees arising had time to develop themselves. If we now imagine, in accordance with what has been above pointed out, that the gas, by means of a piston, is forced out of the upper part of a cylindrical vessel, and that by means of an exterior pipe of communication it is introduced into the lower part of the same vessel, it is evident that it must there flow in with a velocity greater than that of the piston, in the same proportion as the area of the latter is greater than the area of the opening of the pipe. It must consequently reach the lower surface of the piston, spread itself along it, and then descend along the walls of the vessel, in consequence of the sucking arising in the lower corners; and it is consequently evident that if the gas enter, heated to a higher temperature than that of the walls of the vessel, it must soon be cooled by them, so that no advantage can be derived from the greater degree of heat. If, on the other hand, instead of flowing in through a single opening at the bottom of the vessel, the gas is introduced through a great number of small holes, equally distributed over its whole surface, the case will be quite different. The greater velocity with which the gas even now flows in through the small holes is soon neutralized by the sucking arising between them, and the greater circulating motion which in the former case would put almost the whole mass of gas in contact with the walls of the vessel will now be exchanged for a motion of the gas, which on the whole will be an even one, and consequently only the outer parts of the same come in contact with the vessel. Those advantages which are gained by this arrangement can be obtained in several different manners, of which I consider the following the most simple and applicable:—

A, B, C, D (fig. 1), represents a closed cylindrical generator, by which expression I understand a vessel in which the alternate heating and cooling of the gas is produced; and E, F, G, H, another cylinder enclosed in the same, the exterior diameter of which is so much less than the inner one of the former that the space between them forms a sufficiently spacious channel of communication between the upper and lower parts of the generator. The inner cylinder is closed with a lid at the upper end, and one at the bottom supplied with a great number of small holes. Between these lids

and those of the outer cylinder is a space of about the
thickness as between the walls of the two cylinders.
now the piston, K, is raised, the gas above it is forc
rise through the holes in the upper lid, E, F, in order
wards to descend through the space between the cyli
and to enter between the bottoms, C, D, and G, H, an
into the lower part of the generator through the ho
the inner bottom, G, H. It comes consequently into i
diate contact with the two bottoms, which are warm
the furnace; and it must therefore, on entering the
rator, be of nearly the same temperature as they are
little of which will, according to what has been shov
lost during the motion in the generator. When the
is again lowered, the gas goes in an inverted orde
must then enter above the piston, cooled by the
introduced above the lid, A, B. As well through the
nate influence of the warm and cold gas on the walls
cylinders as through their peculiar conducting powe
walls will by degrees assume a state of temperature de
ing from below upwards, by which means the heatin
cooling of the gas will be almost entirely effected i
space between them. That the generator must be su
with a side opening, through which it stands in co
communication with the one end of a working cylind
the same manner as has before been pointed out, an
the transporting piston must be moved by the engi
about the same manner as the valves of a steam engi
of course taken for granted. When the heated gas
from the warm to the cold end of the generator, th
the space between the two cylinders intended for this
pose, it imparts a considerable portion of its heat to
walls, and comes in between the two lids conside
cooled, on which account only a smaller part of its or
heat need be taken away by means of the cooling
The more completely this can be produced the more a
tageous it is, because the heat imparted in the first
tioned manner is not lost, but will, in a very consid
degree, be again taken up when the cooled gas is aga
back in the contrary direction. In order to obtain
object, it is necessary that the space between the cyli
should be made as narrow as possible. As, however
space must form a sufficiently spacious communicatio
tween the two ends of the generator, it cannot be dimi
beyond a certain degree. The greater the generator i

wider must the space evidently be; and in greater engines it should be so large that the stream of gas flowing through it can but imperfectly impart its heat to the surrounding walls, or receive it again from them. In order to avoid this difficulty, one can place between the two before-mentioned cylinders one or more intermediate, by which means the stream of gas can be divided into two or more, each of which can then receive the necessary thinness.

Fig. 2, shows a generator arranged in this manner. The intermediate cylinder is in the figure divided lengthwise into two, in order to form round the generator a sufficiently spacious communication with the working cylinder. If the two halves thus arising, be again divided into two or more parts, that advantage is gained, that the conducting of heat from below upwards will be considerably diminished. Experience has shown me that the manner in which the perforated plate is fixed to the bottom or lid of the generator is by no means indifferent. If it is placed so that it either not at all or only at few points touches the lid of the generator, it will have a very different temperature from that of the latter, whence it is clear that a considerable loss of power must arise. In order to prevent this, one ought to give the plate and the lid as many points of connexion, or, more correctly speaking, as great surfaces of contact as possible, without hindering or obstructing the free passage of the gas between them.

Fig. 3, shows how I have endeavoured to produce this in those models I have hitherto had made. A, B, represents the perforated plate; and *c*, *d*, *c*, *d*, elevated parts thereon, the height of which parts above the surface of the plate is equal to the space which is to be between the plate and the lid of the generator, and whose upper surfaces come into perfect contact with the last mentioned. In order still further to promote the communication of heat between the lid or bottom of the generator and the perforated plates, the latter ought to be made of copper or some other good conductor of heat.

The advantage arising from the manner of moving the gas now described, compared with the first mentioned, is now evident. It is easily perceived that in the first-mentioned arrangement, where the moving of the gas is produced by means of a plunger, a very considerable part of the generator must be occupied thereby, and that consequently the inner space of the generator must be very

much greater than the volume of the gas contained therein. In the last-mentioned arrangement, on the contrary, one can let the gas contained in the generator fill, if not its whole volume, at least the greatest part, whence it follows that the latter can be made considerably less in this case than in the other. Besides this the gas will now during the whole stroke come into contact with the immediately heated bottom of the generator, while, on the contrary, in the first-mentioned contrivance, the gas will, during a part of the stroke, be heated through contact with a part of the generator, which has been heated only by means of the conducting of heat from below, and consequently cannot be quite so warm as the bottom. The heating of the gas must be consequently effected with greater certainty and to a higher degree in the process now described than in the other. Besides this, that advantage is gained that the engine can be heated in a much shorter time, as it is now only necessary to warm the bottom in order to put the engine in motion, while in the first-mentioned process this could not be effected before the heat had propagated itself a considerable distance up the walls of the generator, and for which purpose a rather long time is necessary. From what has been above stated respecting the gas engine arranged in either the one or the other manner, it appears that its power depends in a very great measure on the difference between the temperature of the gas in the warm room and in the cold room, but it is also evident that it equally depends on the degree of compression which the gas received from the beginning. The calculation shows that the gross power of the engine under other similar circumstances is in direct proportion to the primitive degree of compression in the gas. In order to double or treble the power of the engine, it is consequently only necessary by means of the forcing pump to double or treble the quantity of gas contained in the generator, and there are no other bounds for the power of the engine than those which are determined by the strength of its walls and other parts, and the perfection of the joining. Hitherto I have only mentioned in general that in the gas-engine a permanent gas is used, without naming particularly any certain kind. When only the power of the engine is taken into consideration it is of no importance what kind of gas is used; such, however, will not be the case if the attention be directed to other circumstances. If for instance we

should use atmospheric air, which of all permanent gases is the most accessible, this would, through the oxygen contained in it, at length oxidise, and consequently destroy the heated parts of the engine with which it came into contact; if, on the contrary, a gas free from oxygen be employed, or at least one, which on coming in contact with heated metal does not impart its oxygen, this gas cannot act injuriously on the engine. Nitrogen would be in all respects advantageous if a separate operation were not necessary for its production; which operation, though certainly not difficult or particularly expensive, ought nevertheless to be avoided if possible. Hydrogen can more easily be obtained, but it has other inconveniences which render it decidedly inapplicable. Its use might, for instance, lead to dangerous explosions in case the machinist from inattention allowed atmospheric air to enter the engine together with it; besides this it would from its low specific weight escape, in consequence of the unavoidable want of perfect tightness in the engine, in a much greater quantity than a heavier gas. That supplying pump, which in all cases will be necessary in order to compensate the wasted gas, should from this cause be about fourteen times greater if hydrogen be used than if atmospheric air be employed. The most applicable kind of gas I consider to be, that mixture of nitrogen and carbonic oxide which is obtained when atmospheric air is led slowly over red-hot charcoal. If the engine be heated with charcoal or cokes, the easiest manner of obtaining the above-mentioned mixture will be to take it from the fire-place of the engine through a pipe for this purpose introduced therein. From what has been above stated respecting the gas engine, it is evident that it can be employed both as single and as double-acting. Many cases can also occur when it is more advantageous to employ the former than the latter. It must, however, then be considerably modified in order not to cause certain very important inconveniences. We know that the power of a single-acting engine depends on the difference between a greater and a less pressure occurring in the generator, and besides that, even the least occurring pressure must exceed that of the atmosphere, if one will derive sufficient advantages from the engine. It is, therefore, clear that the piston must always, through the very arrangement of the engine, be carried in one and the same direction, and its return in the contrary direction must

therefore be produced by the application of an
power corresponding to the average pressure in th
rator. Such an exterior power might be obtained
through the immediate loading of the piston-rod, or
an eccentrically applied weight on the fly-wheel, b
easy to see what great practical inconveniences mu
from both these methods. If several single-acting
be used at once, they can certainly be so united wi
other that the one in rising depresses the other,
all events those parts of the engine by means of wh
connexion had been effected would be tried by a much
pressure than that which would be employed usefull
is to say, with the sum of those pressures produce
the engines, while, on the contrary, the useful eff
in general depend on their difference. Besides, in
single-acting engine, in which one side of the pisto
in immediate contact with the exterior air, a very co
able waste of gas would always take place throu
want of tightness in the packing of the piston itse
consequently very considerable supplying pumps
become necessary. All these inconveniences can
ever, easily be prevented by uniting that end of the c
which is not in communication with the generat
a reservoir into which gas is pumped to the average p
in the generator. If three single-acting engines wor
the same shaft by means of cranks which are 120
from each other, it is then, however, for very
reasons, not necessary to have any reservoir; on
then only put their cylinders in connexion, and pu
into them to the average pressure in the generator.
the power of the engine through the manner of proc
in question is neither increased nor diminished is e
it aims only at a more even distribution of the
in every revolution it makes.

Finally, I consider it necessary to state that th
engine can, although retaining its peculiarities, be ar
in very many different manners; thus, both the gen
and the cylinders can be placed in a horizontal or i
position, be changed against cylindrical sectors, or in
can take all the different forms which have hithert
employed in steam-engines. Besides this, I ought
that the advantages sought by leading the gas in
generator through a number of holes or openings,
distributed throughout the whole of its bottom or lid,

gained in several different ways. Thus, for instance, the perforated plate can be changed for one or more metal-wire webs, or for a layer of evenly distributed small bodies of a spherical, prismatical, or cylindrical form, the spaces between which can in the same manner as the holes in the perforated plate serve for gaining the above-mentioned object.—In witness, &c.

FABIAN WREDE.

Specification of the Patent granted to THOMAS HUNT, *of Leman-street, Goodman's-fields, in the County of Middlesex, for Improvements in the Construction of Sights for Fire-arms.*—Dated March 12, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of mounting the sight on a ball and socket or universal joint, also in arranging it to be moved laterally by a screw in order to get adjustment, and also in place of engraving the scale on the fixed sight, the scale is engraved on a moveable and adjustable surface, by which arrangement the sight to each fire-arm may be adjusted with nicety.

Having thus stated the nature of my invention, I will proceed to describe the manner in which the same is to be performed by reference to the accompanying drawing in the various figures of which the same letters indicate the same parts.

Description of the Drawing.

Fig. 1, is a plan.

Fig. 2, a side view.

Fig. 3, a longitudinal section; and

Fig. 4, a transverse section taken through the dotted line, 1, 1, in fig. 1. The other views show the various parts in detail. a, is the seat or metal which carries the parts which form my improved sight for fire-arms, &c.; having an opening, a^1, and a recess, a^2, to receive the slide, b; the recess, a^2, is counter-sunk at a^3, which serves to keep down the end, b^1, of the slide, b; the outer end, b^2, is placed in the opening, a^1, and is kept in position by the

garter-screw, *c*, which passes through and works wit
the screw, *c*, is kept from travelling by means of the
screw, *d*, which enters the screw or garter of the sc
so that by turning the screw, *c*, the slide, *b*, and
connected therewith, will be caused to travel later
the recess, a^2, in either direction as the screw, *c*, is
forward or backward, which constitutes the lateral
ment I give to the sights of fire-arms.

The slide, *b*, has a cup or socket, b^3, formed or
thereon to receive the ball, d^1, of the frame, *d*, w
placed in its position by being passed through the
opening, b^4, of the slide, *b*. On the right, left, and
sides of the ball, d^1, a V groove is formed, in either o
the V-formed end, e^1, of the spring, *e*, (attached to th
b,) enters so as to retain the frame in either of these po
viz., upright when in use, or laying down when not re
by fig. 2, or in a reverse direction; the ball, d^1, also
of the frame, *d*, receiving a small amount of lateral
ment as is represented by dotted lines in fig. 4, wh
important, inasmuch as it renders the breaking off the
&c., by accident almost impossible; although the sp
at e^1, is shown as V-formed, it may have a flat surfac
the three grooves of the ball would there be three
surfaces.

In place of engraving the scale on the fixed sight, I
the scale to be engraved upon a moveable and adj
surface, by which arrangement the sight to each fi
may be adjusted with the nicest precision, the frame,
a recess formed therein, in which the graduated slid
caused to move up and down by the garter-screw, *g*,
is kept in its position by the pin, *h*, which enters the
formed for it in the screw, *g*; at the back of the gra
slide, *f*, is a projection, f^1, which has a hole, with a
screw cut therein, for the garter-screw, *g*, to work in;
be evident, therefore, that by turning the garter-screw
either direction, a slight up or down movement of the
f f^1, will take place. The sight, *i*, which is form
shown by the drawing, slides upon the frame, *d*, an
readily be slidden to any position thereon, as indica
the graduated scale, *f*.

Having thus described my invention, and the man
performing the same, I wish it to be understood tha
not confine myself to the exact details herein given.

what I claim is, the construction herein described, wherein the sight is provided with a ball and socket, or universal joint; it can also be moved laterally by a screw to get adjustment, and the scale is engraved on a moveable and adjustable surface.—In witness, &c.

THOMAS HUNT.

Specification of the Patent granted to WILLIAM WALKER, *of Park Malt Kilns, 55, Marlborough-street, Leeds, in the County of York, for Improvements in Drying Malt.*—Dated April 4, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The invention consists of constructing an oven under the kiln, within which is a fire-place suitable to burn coal to heat the oven. Between the fire and the roof of the oven, metal or other flues or tubes are placed to be heated, through which air is passed from the atmosphere to the drying kiln. When wanted to dry with as little fire as possible, and pure air not required, the fire-doors are left open and the dampers closed, which lets the air from the oven pass to the drying kiln. Air is also passed over the oven to the kiln. Cold-air passages are also used for reducing and regulating the temperature.

Having thus stated the nature of the said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, is a horizontal plan in section taken across the furnace above the fire-bars.

Fig. 2, is a horizontal section taken at 1, 1, in fig. 3.

Fig. 3, is a vertical section taken from front to back; and

Fig. 4, is a vertical section taken from side to side of the furnace and heating apparatus. In each of these figures the same letters are used to indicate similar parts; *a*, *a*, is the floor of a malt-kiln, which consists of perforated tiles, and it is supported by bearers of angle iron, the ends of which are built into the walls; *b*, *b*, are the fire-bars of the fire-place. The products of combustion usually pass down

from the heated chamber, *c*, *c*, formed above the fire, through flues or passages, *d*, *d*, into the chimney, *e*, as indicated by the arrows; and thus are heated, not only the chamber, *c*, *c*, and air-pipes passing through it, but also the lower parts of the building; and the passage away of the products of combustion into such flues or passages is regulated by the slides or valves, *f*, *f*; ordinarily the products of combustion do not pass through the floor of the kiln, but they may do so if desired, by opening the slide or valve, *g*, at the upper part of the chamber, *c*, as will readily be understood on examining the drawings. Across the chamber, *c*, from front to back, are applied a series of pipes or tubes, *h*, *h*, through which air passes and becomes heated, and then rises upwards, and passes through the floor of the malt-kiln. Hence it will be seen that the products of combustion are ordinarily kept from the malt whilst the heated air only passes to the malt-kiln, by which means the impurities of the products of combustion are kept from the malt, and the pure clean heated air is only used; but if desired, the heated products of combustion may also be allowed to pass with the heated air. I, however, prefer to keep these matters separate; *i*, *i*, are openings for the passage away of the vapours from the malt, such openings entering into chimneys, *j*, *j*, as shown; *k*, *k*, are passages for admitting cold air for adjusting the temperature of the air. I would remark, that although I have been particular in describing the exact arrangement preferred by me for carrying out my invention, I do not confine myself thereto, as variations may be made in the details, and yet the peculiar character of my improvements be retained, whereby air is heated by passing through suitable pipes, tubes, or passages heated by the fire, such heated air being ordinarily alone used for the malting process, and it will be evident that the form of the parts may be varied, and yet obtain these results.

What I claim is, the mode herein described of constructing and heating malt-kilns.—In witness, &c.

WILLIAM WALKER.

Specification of the Patent granted to THOMAS RICHARDSON, *of Newcastle-upon-Tyne, Manufacturer, for Improvements in the Manufacture of Certain Salts of Magnesia and a Red Colouring Matter.*—Dated June 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists in diffusing impure carbonate or hydrate of magnesia in water, and passing carbonic acid obtained from coke or other sources through the same. After allowing the impurities to subside, the clear supernatant liquid is drawn off and boiled, or otherwise heated, to obtain the ordinary carbonate of magnesia.

And my invention also consists in heating sulphate of iron, or impure sulphate of magnesia containing sulphate of iron, with ground fluor spar, and by such means to obtain colouring matter and sulphate of magnesia. The impure hydrate of magnesia, which is a waste product in what is known as Ward's process of carbonating soda ash, is especially adapted for the manufacture of carbonate of magnesia by my process; but any other impure hydrate or carbonate of magnesia, free from lime or nearly so, such as magnesite, may be employed. I take any of these forms of magnesia and diffuse them through water, so as to form a cream or milk-like liquid, which I run into a large soda-water machine, where I pump in carbonic acid, in the same manner as when making soda-water. Or I partially fill a wooden box, divided into cells by partitions running from the top and bottom, alternately with this milk-like liquid, and by means of a steam-jet or air-pump worked by suitable machinery, I draw a stream of carbonic acid through the whole series of compartments from a furnace filled with coke or charcoal. When the liquid becomes saturated with bicarbonate of magnesia, or stands at five to eleven degrees on Twaddell's hydrometer, it is drawn off, and after standing about an hour, a small quantity of a cream of magnesite is gradually added, which I find carries down all oxide of iron and other impurities, leaving a clear pure solution of bicarbonate of magnesia. This solution is heated to expel the excess of carbonic acid, when the carbonate precipitates, and is collected and heated in the usual way, or a quantity of pure magnesia in suspension in water is added until the whole is precipitated as carbonate of magnesia.

The furnace which I employ for producing carboni
is filled with coke or charcoal, and is supplied wit
through an opening at the bottom, and another high
on a level with the top of the fuel. The air may be
through by means of a jet of steam or otherwise, or
forwards by a blowing cylinder or fan blast, so regu
by valves or dampers that the supply of air entering
upper opening shall be a little more than sufficient t
vert all the carbonic oxide into carbonic acid, so
economise the fuel and render the action of the gas
energetic on the milk of magnesia; carbonic acid obt
from any other source equally answers my purpose.
character of the furnace is shown in elevation in fig.
section in fig. 2, and the plan in fig. 3. *a*, represents
blast, which may be replaced by a blowing cylinder;
c, are the two pipes which convey the air above and
the coke or charcoal, *d*; and the relative quantiti
regulated by the valves, *e* and *f*. The carbonic acid
off at *g*. The ashes and scars are removed at *h*, an
coke is thrown in at the door, *i*. Grates may be emp
as shown at *k*, when the ashes do not scar. At pres
some manufactories, the impure sulphate of magne
calcined at a high temperature, in order to convert th
and manganese into insoluble oxides. This operat
attended with considerable loss of sulphate of mag
even with the addition of magnesia to the impure E
previous to calcination. To obviate this loss I empl
part of fluor spar for every four parts of the sulpha
iron or manganese present in the impure Epsoms, to
with the ordinary quantity of magnesia, and calcin
mixture at a very low temperature. A double decom
tion ensues between the metallic sulphates and the
spar, while the metals are rapidly peroxidized and re
insoluble. The calcined materials are lixiviated and
in the usual way for obtaining pure Epsom salts, whi
metallic oxides may be employed as a colouring ma
Fluor spar may also be calcined with the sulphate o
in the manufacture of Venetian red. I employ the co
and fluor spar in the same proportions as already n
and so much less gypsum as corresponds with that pro
from the fluor spar during the operation, the other ma
of the batch remaining the same. The operation is
ducted in precisely the same manner as at present;
find the oxidation is so much more rapid and perfec

one furnace turns out as much crude Venetian red as three without the use of the fluor spar.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood, in respect to the first part of my invention, that I do not claim dissolving hydrate or carbonate of magnesia in general by the employment of carbonic acid and water, nor the precipitation of carbonate of magnesia from its solution in the form of a bicarbonate, either by heat or magnesia as above described, as these have been long known to and practised by chemists.

But I claim the heating impure magnesia, such as results from Ward's process or magnesite, or such like mineral, with carbonic acid and water, as described above, in the manufacture of pure carbonate magnesia.

I also claim the use of fluor spar and sulphate of iron for making a red colouring matter, either alone or in connexion with the preparation of pure sulphate of magnesia.—In witness, &c.

THOMAS RICHARDSON.

Specification of the Patent granted to GEORGE HERBERT, ***of Summerhill, Dartford, in the County of Kent, for Improvements in Constructing and Mooring Light Vessels, Buoys, and other similar Floating Bodies.***—Dated April 8, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of making the outer surface of the bottoms of light vessels concave or conical, combined with means of taking in and letting out cable in such manner that the cable shall be held and the vessel moored at the upper part of the conical or concave bottom. And in constructing buoys and such like floating bodies, they also are made with concave bottoms, the mooring chains or cables being fixed to the upper part of the concave or conical bottoms.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

My invention has for its object so to construct light vessels, and also buoys, and such like floating bodies that they may be moored at or as near as may be to their lines of flotation, and if convenient at or as near as may be to their centres of gravity, for which purpose the bottoms of such floating bodies are, according to my invention, made hollow or concave, so that the point or points at which such a floating body is moored, may be so much above the lowest part of the floating body as to bring it or them to or as near as may be to the line of flotation or to the centre of gravity.

Description of the Drawing.

Fig. 1, is a section of a light ship or vessel.

Figs. 2 and 3, are two horizontal sections; and

Fig. 4, is a plan of the deck. This vessel is circular and cylindrical at the upper part above the water line. The bottom of this vessel where the mooring takes place consists of a hollow cavity or cone, *x*, *x*, *x*, which rises to or above the line of flotation of the vessel, and it is this which constitutes the peculiarity of my invention. There is at the upper part of the concave or conical recess in the bottom of the vessel, as shown, an opening and a tube for the passage of the chain cable, which is let out or taken in by means of a windlass or otherwise.

The drawing shows a particular arrangement of decks and divisions into rooms, which may, however, be varied as circumstances may dictate; the arrangement of the interior of the vessel constituting no part of my invention. In the arrangement shown, *a*, *a*, is the deck; *b*, *b*, the tabernacle into which the mast is stepped; *c*, *c*, the iron circle from which beams of deck radiate to the sides of the vessel; *d*, *d*, four pillars to support the tabernacle and beams of deck radiating to *c*, *c*; *e*, *e*, the windlass deck; *f*, *f*, eight pillars supporting iron circle, *c*, *c*, and windlass deck; *g*, *g*, the flooring; *h*, *h*, eight pillars supporting flooring; *k*, *k*, iron circle to which angle iron of the cone is fixed; *l*, *l*, iron circle to which angle iron of the cone and angle iron of the sides of the vessel are fixed; *m*, hawse pipe; *n*, *n*, ties of hawse pipe; *o*, *o*, store rooms.

Fig. 5, shows so much of a vertical section of a buoy or such like floating body as will enable me to describe my improvements as applied thereto. This buoy or vessel in its exterior form is to be constructed as heretofore, and ac-

cording to the purpose to which it is to be applied; but in place of constructing the lower part so as to be moored from its lowest part, it is made with a hollow or concave bottom. The drawing shows the bottom to be of the form of a hollow cone, which I consider to be the best construction, but it is not absolutely necessary that the hollow part of the bottom should be conical, so long as the point at which it is moored is raised internally, by the bottom being concave or hollow, as herein explained.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is, the construction of light vessels, buoys, and such like floating bodies with concave bottoms, and suitable arrangements for mooring from the upper parts of such concave bottoms.—In witness, &c.

GEORGE HERBERT.

Specification of the Patent granted to EDWARD CLARENCE SHEPARD, *of Trafalgar-square, in the County of Middlesex, Gentleman, for Improvements in Magnets, Electric Apparatus, suitable for producing Motive Power, of Heat and Light.*—Dated July 1, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object improvements in the apparatus described in the specification of a former patent granted to me on the 6th day of July, 1852, and the improvement consists of peculiar means and combinations of apparatus for coupling up the metallic circuits by which induced currents of electricity are conducted to and caused to decompose water, and thus to obtain with greater advantage than heretofore gases for the purposes of producing motive power, light, and heat.

Having thus stated the nature of the said invention, I will proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, shows a transverse section of a machine combined according to the invention.

Fig, 2, is a longitudinal section of the same.

Fig. 3, is a transverse section of the machine, to a scale of one-half of the real size, by which figure the mode of connecting up the wires of the several coils will be readily traced and understood.

Fig. 4, shows a longitudinal section of one of the coils showing more clearly than can be done in the other figures, the position of the coil in regard to the permanent magnets between which the coils work.

Fig. 5, shows part of a transverse section of one of the wheels of coils used in the machine.

Fig. 6, shows a transverse section of the shaft or axis of the machine, together with the arms of metal by which the wires of the coils are coupled up, as will be hereafter fully described.

Fig. 7, shows a plan of the parts by which the electric currents are conducted to vessels containing water to be decomposed. In each of these figures the same letters indicate the same parts. The machine is arranged to work with five wheels of coils, but other numbers may be used. Each wheel has sixteen coils, which by their movement near to permanent magnets receive induced currents of electricity, and from which such currents of electricity are conducted to decompose water as hereafter explained; and it may be stated that in the arrangement shown, each coil of insulated wire is composed of about five hundred feet of No. 18 copper wire, wound on iron tubes, but this, as well as the size of the coils, may be varied. The coils are arranged and coupled up in four sets of four; *a*, *b*, *c*, *d*, in each case representing a set of four coils; A, A, are the two end framings of metal, and C, C, are horizontal bars of wood by which the two end framings, A, are combined, as is clearly shown in the drawings. Each wheel of coils is placed between the ends of eight magnets in such manner that the wheel may revolve in close proximity with the magnets. It is preferred that horse-shoe magnets should be used, fixed with their respective poles in the positions shown by the drawing, N and S, respectively representing the north and south poles not only of the magnets, but also of the coil, all which will readily be understood by reference to the drawings. B, is the main axis or shaft of the machine which is to receive rotatory motion by manual or other power. The wheels of coils are fixed on this shaft or axis by the metal arms, H; and it should be understood

that each wheel of coils, with its magnets, acts as one machine, a description, therefore, of the construction and mode of action of one of the wheels of coils will apply to all.

H, H, are arms fixed to or formed with the boss or nave, H^1; the nave, H^1, is fixed on the axis, B. The arms, H, have a circular frame, H^2, fixed thereto, in which are as many semicircular recesses as there are coils, as is clearly shown in the drawings; and the coils are secured in those recesses by means of bent plates, H^3, and screws. On the axis or shaft, B, is fixed a boss, P, with eight metal arms, the construction of which boss will be readily understood by reference to figure 6. It is constructed of several parts; that part which surrounds and comes in contact with the axis, B, is of wood, or of other non-conducting or insulating substance, with a view to keep the arms, P, insulated from the axis, B, and from each other. On the wood are eight rings of copper, F, and between them are seven rings or washers of gutta percha or other insulating matter. G, G, are eight copper wires, the one ends of which are constantly in contact with the metal rings, F; consequently, the electric currents which are conducted by the arms, P, into the rings, F, pass to the wires, G, and thence by a pair of wires, G, are conducted to bottles or vessels, I, containing the water which is to be decomposed. Each of the wires, G, of a pair, has a blade of platina fixed to it to enter the water. J, is a tube of gutta percha, or other suitable material, which is connected to the tube, K, by which the gases are conducted to actuate a suitable engine to produce power, or to produce light or heat.

I will now describe the manner of coupling up the two ends of the wire composing each of the coils, *a*, *b*, *c*, *d*, of each of the series of four coils. This coupling up will be readily understood by reference to fig. 3. Each arm, P, has four wires in metallic connexion with it, and the arms, P, are each bent at right angles where they enter the wood or insulating material, which surrounds the axis, B. Each such bent end of the arms, P, is put in metallic connexion with one of the rings, F, and is kept insulated from the other rings, F, and from the axis, B. One end (say the inner end) of the wire, 1, of each of the coils, *b*, is connected with the arm, P^1, the other (say the outer end) of the wire, 2, of each of the same coils, *b*, is connected with the arm, P^2, and in like manner are the ends of the other wires composing the other coils, *a*, *c*, *d*, connected to the other arms, P, as shown by this figure. By this arrangement or mode of

combination it will be seen that the metallic circuit in the pairs of wires, G, will be uninterrupted, and there will be no making and breaking of contacts as in my former machine, and this, therefore, is an important improvement in the machinery. In like manner, as above stated, as one of the wires of each of the coils, *c*, coupled up to the arm, P^3, the other end of each of those wires being coupled up with the arm, P^4, and the arms, P^3, and P^4, are put in metallic connexion with the next two neighbouring metal rings, F, and with a pair of wires, G. The wires of the coils, *d*, are in like manner connected with the arms, P^5, and P^6, and the wires of the coils, *a*, are in like manner connected with the arms, P^7, and P^8. It will be understood that there are four vessels containing water, and that the water in each vessel is in direct and constant metallic connexion with the two ends of the four wires forming four of the coils, and the revolution of the wheel of coils near to the right magnets (four on each side), between which each wheel revolves, will receive induced currents of electricity, and such currents will be conducted to and decompose the water in the vessels.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I do not claim the use of a number of coils, nor the mounting them as a wheel on an axis, nor the causing of a number of coils so mounted to revolve between and nearly in contact with the ends of magnets, neither do I claim any of the parts separately, of which the machine is composed.

But what I claim is, the mode herein described of coupling up or combining the metallic circuits of the several series of coils.—In witness, &c.

EDWARD CLARENCE SHEPARD.

Specification of the Patent granted to JOSEPH BETTELEY, *of Liverpool, in the County of Lancaster, Anchor Manufacturer, for Improvements in Anchors.*—Dated May 21, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of two improvements in the construction of anchors,

First, in the mode of forming and affixing the arms to the shank of an anchor. The arms are each of a curved form, and the ends (by which they are fixed to the shank and to each other) cross each other, and incline and run into the shank; and in this state the parts are welded together, by which mode of combination greater strength will be obtained and facility of manufacture.

Secondly, in applying a disc on the shank of an anchor, in which disc are formed sockets to receive the stock, which is made in two parts, the shank of the anchor passing through the disc.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a side view,

Fig. 2, an edge view; and

Figs. 3 and 4, show the manner of forming and putting the parts together. *a*, is the shank of the anchor; *b*, *b*, are the arms, which are of a bent or curved form, and where they join with the end of the shank, they cross each other and the end of the shank; and by such means a very strong welding of the parts together may be accomplished. The flukes are made each of two surfaces, meeting together at an angle near the middle, at *c*, by which the penetrating and holding are benefitted. Near the other end of the shank is fixed a disc, *d*, and above the disc is applied the iron stock, which is of two parts, and put together by hoops or screw-bolts or nuts, as shown, and the stock may be fixed, by means of sockets formed to receive the same, on the disc, as shown by fig. 5, or by passing a bolt through, as shown in figs. 1 and 2.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I do not confine myself to the details herein given.

But what I claim is, the mode of constructing and affixing the arms and palms to the shank.

I also claim the application of a disc, and the means of forming and fixing the iron stock.—In witness, &c.

JOSEPH BETTELEY.

Specification of the Patent granted to CHARLES LOWE, *of Sheepy Hall, in Sheepy Magna, in the County of Leicester, Corn Miller, for Improvements in Mills for Grinding Wheat and other Grain.*—Dated April 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improvements have reference to that part of a flour-mill commonly called the stone case, and also to the spout or spouts by which the flour or meal is conveyed away from the stones. I use a spout marked C, on the top of the case, to aid the escape of the heated air. It is a well-known fact that grain in general, but especially when in a damp state, becomes more or less heated during the process of grinding, while at the same time a portion of the water or moisture contained in it is converted into steam or vapour, which, owing to its specific lightness, does not readily descend through the spouts, and owing to the centrifugal force imparted to it by the runner stone, with which it is in contact, it cannot escape over the back of the stone, and consequently it condenses and forms paste in the case and spouts, thereby causing considerable loss and inconvenience. It will be seen by referring to the accompanying drawing, that my invention consists,

First, in the use of a skeleton and ventilating case, A, or other framework surrounding the stones, covered with cloth, wire, gauze, bolting-cloth, horsehair, or any other substance that will retain the flour and allow the heated air and moisture to escape through it. And,

Secondly, in forming the sides and covers of the flour or meal spouts, B, B, in a similar manner, and covering them with the same or any other substances that will effect the separation of heated air and moisture from the flour or meal.

Having now described my said improvements in mills for grinding wheat and other grain, and the manner of performing the same, I declare that what I claim as my invention is the formation of the stone case and spouts of cloth, wire, gauze, or any other similar substance that will allow the heated air and vapour to pass through it

away from the flour, either in ordinary mills, or in mills in which air-blasts, exhausts, or similar artificial means are used.—In witness, &c.

CHARLES LOWE.

Specification of a Patent granted to JOSEPH WEBB, *of Mayfield-terrace, Dalston, in the County of Middlesex, for Improvements in Rotatory Engines.*—Dated May 17, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of a fixed cylinder with end cover, through which a hollow axis passes, and through this axis the steam or fluid from the boiler, or source of supply, flows to the interior of the cylinder. On the axis is fixed a piston touching the interior of the cylinder at two points. There are two or more abutments or slides passing from the exterior to the interior of the cylinder, their ends being in contact with the piston. In one of the end covers of the cylinder there are openings for the fluid to pass out of the cylinder. There are passages through the piston communicating with the hollow axis, through which the fluid flows and presses against and moves the piston round with its axis. The back of the piston towards the vacuum or least pressure side is a convex curve, offering a larger extent of surface than the front of the piston through which the fluid flows or passes.

Having thus stated the nature of my said invention, I will proceed to describe the means of performing the same.

Description of the Drawing.

Fig. 1, is a section taken transversely through the engine and axis; and

Fig. 2, shows a section taken through the axis and engine longitudinally of the axis; and

Fig. 3, is an external view. In these figures the same letters are used to indicate similar parts: *a*, is the steam or fluid pipe into the box, *b*, from which it flows by the passages, *c*, *c*, by the passages, *d*, through the piston, which

enlarge as they proceed outward from the centre. piston touches the cylinder, *h*, at two places at all ti shown. The cylinder, *h*, is made with three reces buttresses, *e*, *e*, which move on axes so as at one tim within their recesses and form a continuation of the i of the curve of the cylinder, *h*, and at other time become buttresses to the fluid, the pressure of th pressing one edge of them against the piston, as is The buttresses have weights, *x*, which tend at all to place the buttresses into a position to resist the p of the fluid and thus to force the piston round witl cylinder; *f*, *f*, are the outlets by which the fluid flow the exterior of the cylinder, *h*; *g*, *g*, are the slots t the valves, f^1, f^1.

Having thus described the nature of my said inv and the manner in which the same is performed, I have it understood that I do not confine myself details as shown and described, as the same may be without departing from the peculiar character of my tion, which consists of employing passages issuing hollow axis or shaft, and bending round such shaft o and enclosing the same in a cylinder, as shown a scribed. The arrangement shown, however, by the ings, and described above, I believe to be the b carrying my invention into practice.—In witness, &c.

JOSEPH W

Specification of the Patent granted to JOHN SCOTT, *of Greenock, in the County of Renfrew, North E Engineer, for Improvements in the Treatment or facture of Animal Charcoal.*—Dated March 14, 18

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., My said invention relates to the so arranging the ovens, or furnaces used for reburning and cleansi animal charcoal used in sugar refineries, that the material may be cooled by a continuous process w the use of water; so that the charging and discharg the material goes on uniformly and continuously, the quality of the reburnt charcoal is very superior, a

cost of the process is economized. The kiln is arranged with a series of vertical tubes, surrounded by fire or hot-air flues, and into these tubes the charcoal is placed to be burned. Immediately beneath this set of tubes or retorts is a second set, of smaller content, also set vertically, the axis of each tube in this lower set being coincident with that of its corresponding retort. When a charge has been burned, the attendant opens a slide in the bottom of the retort, and discharges about one-third of the charcoal in it, letting this quantity fall down into the tube below. When this discharge is effected, the lower tube being filled, or nearly so, the operator shuts up the tube, and allows the contained charcoal to cool by an external circulation of air. The upper part of the retort then receives a fresh supply of the unburned charcoal to fill up the emptied space; and thus the operation goes on throughout the whole series in the kiln. A good current of cold air is kept circulating round the cooler tubes, and this air is then passed up in its partially heated state to the retort furnaces above, where its heat is made available for securing further economy in its action upon the furnaces from which the original re-burning or charring heat is derived.

Fig. 1, on sheet 1 of my drawings is a half elevation and half vertical longitudinal section of one modification of this class of improved kiln.

Fig. 2, on the same sheet, is a transverse sectional elevation of the hot-air chamber of the kiln, one-half of the view showing the charcoal pipes, with their corresponding coolers and the hot and cold air flues, whilst the other half of the view represents the opposite side of the hot-air chamber, with the pipes removed therefrom, and exhibiting only the exhaust flues and the supporting columns.

Fig. 1, on sheet 2 of my drawings, is a corresponding plan of the apparatus, partially in horizontal section; and

Fig. 2, on the same sheet, is a complete horizontal section of the kiln at a lower level.

The kiln, which is built up of brickwork, almost wholly supported on cast iron columns, mainly consists of an arrangement of charring tubes or contaminated charcoal retorts, A, surrounded by fire or hot-air flues, B. It is into these tubes that the vitiated charcoal, as it comes from the syrup filters, charged with the impurities separated from the syrup in the filtering action, is placed to be reburned,

to carry off the contained impurities, and refit it for subsequent use as a filtering medium. Immediately beneath this set of retorts is a second set of tubes, C, of smaller bore, which act as the closed coolers for the reburned charcoal. These tubes, C, are also disposed vertically, and the axis of each cooler is exactly coincident with that of a corresponding retort above it.

In the plan, fig. 1, on sheet 2, the quarter division, *a*, represents the top plate of that section of the kiln with the cover removed, and exposing the guard plate beneath it. The next section, *b*, is a plan of the bottom plate of the kiln, with the brickwork removed from it. The third portion, *c*, shows the top plate, with the cover thereon; and the fourth division, *d*, is a horizontal section showing the fire bars, hot-air and exhaust flues, flue door, and retorts.

The view, fig. 2, on sheet 2, is a horizontal section of the kiln apparatus, taken through the ash pit, the front portion showing the coolers, cold-air flues, and the columns for supporting the kiln; the back part showing the ash pit door and the columns, which, besides supporting the kiln, serve also to convey the smoke to the chimney through the flues, as delineated in dotted lines. The primary heating retort furnace is at D; E, is the cover plate; and F, are the exhausting flues. The cold-air flues are at G; and H, are the supporting columns of the structure. The main heating flues are at I; J, is the flue door, with a smaller central door in it for examining the state of the retorts and flues when in action; and K, is the ash-pit door, which is kept shut, so that all the cold-air for supplying the furnace must pass through the coolers and cold-air flues, so as to cool the charcoal in the refrigerating tubes, C, whilst the succeeding charge is being burned in the retorts.

When a charge of impure charcoal or carbonaceous matter has been burned, the operator opens a slide in the bottom of each retort, as delineated in the sectional portion of fig. 1, on sheet 1 of my drawings; through this opening he discharges about one-third of the burned charcoal in the tube, allowing it to fall away into its cooler below. When this is done, the cooling tube being filled, or nearly so, the intermediate discharging slide is closed, and the two tubes are thus wholly disconnected. In this condition, the cooler tube being completely shut up from contact with the external atmosphere, its contents are rapidly cooled down

by an external circulation of cold air along the passages, G, surrounding the tube, C. This proceeding obviously causes a partial vacuum in the actual burning retort, A, and the workman then fills up the emptied space at the upper end of the retort with a fresh supply of the impure charcoal. In this the charging, reburning, discharging, and cooling, all go on consecutively and uninterruptedly throughout the whole series of retorts in the kiln; a rapid current of cold air being carefully kept up all around the refrigerators.

Having now described and particularly ascertained the nature of my said invention, and the manner in which the same is or may be used or carried into effect, I may observe, in conclusion, that I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of my invention; but what I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited letters patent, is,—

First, the general arrangement and construction of kilns, ovens, or furnaces, for the treatment or manufacture of animal charcoal, as hereinbefore described.

Second, the system or mode of treating or re-burning animal charcoal, wherein the burning and refrigerating or cooling processes are simultaneously and continuously carried on, and without atmospheric exposure, or the use of water.

Third, the application and use, in charcoal kilns or ovens, of secondary closed cooling tubes or refrigerators, capable of being connected to and disconnected from the retorts, for the purpose hereinbefore described.

Fourth, the system or mode of arranging and constructing charcoal kilns, wherein each retort or burning tube has connected with it a close refrigerating or cooling tube.—In witness, &c.

JOHN SCOTT.

Specification of the Patent granted to OCTAVIUS SMITH, *of Bedford-square, and* YOUNGS PARFRI *in the County of Middlesex, for Improvements Manufacture of Carriage Wheels.*—Dated May 1(

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. This invention consists of casting parts of the n carriage wheels of metal in such manner that eac has sockets or openings to receive the spokes, centre of the cast part is hollow to receive wood material. The box for the axle tree is fixed in material, and the ends of the spokes rest upon material so introduced into the nave.

Having thus stated the nature of our invention, proceed to describe the manner in which we perf same.

Description of the Drawing.

Fig. 1, shows a plan or external view of a na structed and combined according to our invention.

Fig. 2, is a vertical section taken at the line, fig. 1, parts of the spokes being also shown in their

Fig. 3, is a longitudinal section through the line, fig. 1; and

Fig. 4, is a plan of the wood or soft material w introduced into the hollow of the cast part of the na these figures the same letters of reference are used cate the same parts. E, is the cast metal portion nave of a wheel, the contour of which may be E', E', are sockets for receiving the spokes, F, F interior of the casting, E, is hollow, and receives th of wood, G, or it might be of other soft material wood is formed with a groove, G', of a width suit receiving the ends of the spokes, as is shown, and t ends of the spokes come against the soft material, G outer end of this part, G, of the nave of a wheel is with hoops, H, H, and the box, I, for the axle is l and fixed in the part, G, of the nave, in like manner t like boxes have been heretofore fixed in naves of made of wood.

We would remark, that, although we believe woo

the best material for the part, c, of the nave of a wheel made according to our invention, other soft material, such as gutta percha, combined with sawdust, may be used in place thereof.

Having thus described the nature of our invention, and the manner of performing the same, we would have it understood that what we claim is, the construction of naves of wheels as herein described.—In witness, &c.

OCTAVIUS HENRY SMITH.
YOUNGS PARFREY.

Specification of the Patent granted to BENJAMIN LOOKER, *junior, of Kingston-on-Thames, in the County of Surrey, for Improvements in the Manufacture of Bricks.*—Dated July 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—In building, it is often necessary to divide a brick into parts, and the object of this invention is to facilitate such dividing of bricks, to save labour, and, as much as may be, to prevent waste. And my invention consists of making bricks with transverse slits or openings through them, at those parts where it is desired they should be divided.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, is a plan of a brick of the form I prefer to make, in order to facilitate the division of perforated bricks, at the lines, *a*, *b*, *c*; but it will be evident that the form of the openings or perforations at the lines, *a*, *b*, *c*, where a brick is to be cut or divided, may be greatly varied; the object to be attained is, that the substance of the bricks at the lines, *a*, *b*, *c*, should be less or more divided than across other parts of the bricks, so that a brick at the lines, *a*, *b*, *c*, will more readily cut or divide at those lines than at other parts of the bricks. I prefer, however, that the perforations at the lines, *a*, *b*, *c*, should be slits, as is shown in the drawing at fig. 1; but the relative strengths may be obtained by having larger or more numerous perforations at the lines, *a*, *b*, *c*, than across other parts of a brick.

Fig. 2, shows a plan of a brick, where the perforations are somewhat larger across the brick at *a*, *b*, *c*, than those across other parts, by which a like facility is offered for cutting or dividing a brick; and

Fig. 3, shows a brick where the perforations across a brick at the lines, *a*, *b*, *c*, are more numerous than across other parts of the same brick.

In making these bricks I prefer to employ machines which force brick earth through moulding orifices, using cores suitable to produce perforations, such as are indicated. But I do not confine myself to making such bricks through moulding orifices, as bricks according to my invention may be made by moulding in moulds provided with suitable cores. I wish it, however, to be understood, that I do not claim the making of perforated bricks, either by forcing clay through moulding orifices, or by moulding in moulds, except when provision is made for dividing the bricks by employing cores, for the purpose of causing the substance of the bricks across the lines, *a*, *b*, *c*, to be more divided, or less in quantity than across other parts of the bricks.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is, the manufacture of perforated bricks herein described.—In witness, &c.

BENJAMIN LOOKER, JUN.

Specification of the Patent granted to JOHN FALL, *of Charlton-upon-Needloch, in the City of Manchester, Gentleman, for Improvements in the Treatment of Certain Oils.*—Dated July 5, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists in dissolving common yellow resin, colophony, Burgundy pitch, terebinthine, or turpentine materials, as they exude from the tree; copaiva resins, and the products of the distillation of such resins, gum damar, gum thus, wax, balsams, and such like resinous and gummy matters (hereinafter called by me resinous and gummy matters), in oils procured by distilling coals, peat, petroleum, bitumens, asphaltes, shales, schists, blacs, and other mineral substances capable of yielding bituminous matters by the application of heat, so as to thicken and improve such oils,

and render them more suitable for lubricating machinery, manufacturing wools, and the like animal substances, and other useful purposes. The oils I deem best suited for my purpose are the light oils produced from peat, and the mineral substances above mentioned, by distillation at a low temperature, and are known at present by the names of paraffine and upion oils, which oils are thin in consistency, and from that cause have not yet been much used for lubricating purposes, owing to the circumstance of their running away from the machinery to which they are applied when it is in motion. This defect I propose to remedy, by combining such oils with the resinous and gummy matters before named, and thus giving them body and rendering them more suitable to be applied for the purpose of lubrication. In the manufacturing of wools and like animal substances, paraffine and upion oils have not been employed, owing to their want of body and the circumstance of their not being easily washed out of the wool when manufactured; but when in union with resinous and gummy matters before mentioned, the latter combine with alkaline solutions, and thus assist in the removal of the oil.

Having thus stated the nature of the invention, I will proceed to describe the manner in which the same is to be performed. I employ, in preparing the said lubricating and wool-manufacturing materials, a large boiler or heating vessel, heated either by fire, steam, hot air, or otherwise. In this vessel I place the oil to be operated on; and to quicken the solution of the resin I heat the oil up to 200 degrees of Fahrenheit's thermometer. I then add the resinous or gummy matters, preferring to use common yellow resin, but the other substances before mentioned will answer the purpose (which have been previously reduced to powder or divided into small pieces when solid), by placing them in a bag made of woollen cloth, or some other good filtering material, and suspending it from a suitable support in the midst of the oil. By these means the resinous and gummy matters are dissolved in the oil, whilst any impurities they may contain are left in the filter; when all the soluble parts of the resinous and gummy matters have been combined with the oil, the filter can be removed, and, having been well cleansed, may be again filled with resinous and gummy matters, and placed in the oil as before mentioned. I have found equal quantities of the mineral oil and resinous and gummy matters to produce

superior lubricating materials, that is, one hundred- of yellow resin to one hundred-weight of mineral oi the same proportions I have found to produce an manufacturing wools and the like animal substance the oil can be made thinner for light machinery, by k out some of the resin; or a thicker oil can be m desired, by adding more than the proportions here varying the thickness of the oil according to the l machinery to be lubricated. The above proport specify rather as guides, and do not confine myself t only in these proportions, and the manner of dissolvi resinous and gummy matters may be greatly varied.

Having stated the nature of the invention, and th ner of performing the same, I would have it und that what I claim is, the combination of the materials described in preparing lubricating matters for mac and in preparing oils for manufacturing wool an like animal substances, and other useful purpose witness, &c.

JON F.

Specification of the Patent granted to WILLIAM TOPHER, *of Euston-square, and* GUSTAVUS GIDL *Robert-street, Hoxton, for Improvements in Abst Sulphur and other Matters from Vulcanized India-* —Dated June 16, 1853.

To all to whom these presents shall come, &c., In manufacturing vulcanized india-rubber, or formed of that material, it is desirable in many case the usual operations of vulcanizing the caoutchouc manufactured articles themselves, to withdraw or se some portion of the sulphur, or of the excess of s that remains interposed in the pores of, or is co with the caoutchouc, or, in other words, to adjust th tive proportions of the sulphur and the caoutchouc vulcanized material, for other ordinary or any special cation of it.

It is desirable also to be able to work up or e refuse vulcanized india-rubber, such as the parings tings, &c., that accumulate in manufactories of that rial, or by some ready and economical method of t

such refuse to separate from it the sulphur, or so much sulphur as leaves the caoutchouc in a condition to be acted upon by its usual solvents, and consequently restoring it to a condition admitting of its being re-worked in any form, and, if required, vulcanized either with sulphur or another material.

Now, our invention consists in macerating the vulcanized india-rubber in a hot solution of carbonated alkali, or in a solution of hydrate of lime, or in hot water, in which caustic lime is suspended, till, through the action of the alkali or of the lime, the requisite quantity of sulphur is abstracted; that is, either as much sulphur withdrawn as reduces the relative proportions of the sulphur and the caoutchouc to those required for any special purpose, or so far removes the sulphur as to leave the residual material in a condition to be acted on by the usual solvents or softeners of caoutchouc, so as to adapt it for re-formation into manufactured articles, and of being re-vulcanized with sulphur or another material, if required.

We prefer that the vulcanized caoutchouc to be so treated should, when it admits of it, (as when the refuse parings or cuttings, &c. are to be worked up,) be comminuted or cut up into small pieces—for the action of the alkali or of the lime is the more rapid in proportion to the extent of surface it acts upon, or the thinness of the pieces it has to penetrate. And as the higher the temperature of the solution, or of the water, the quicker is the operation, we prefer to use a boiling heat in the process, though a lower temperature will subserve the same purpose, finally requiring only a greater length of time when the caoutchouc has a large quantity of sulphur to be removed; we prefer, from reasons of economy, in the first place to boil it along with the caustic lime, which takes up the sulphur lying at or near the surface of the mass or pieces of the caoutchouc, then to remove the solution so produced, and the lime, and boil with a solution of carbonate of soda. After some time, the whole of the excess of sulphur or uncombined sulphur may be thus abstracted, acted upon, or rendered soluble, in either the lime or the carbonated alkali. In this way, after some time, and when the process is carried far enough, the sulphur in excess is abstracted, together with other matters constituting impurities, that may have been found in the process of vulcanizing, or afterwards manufacturing from

the caoutchouc, and it will then be found to be soluble in turpentine, naphtha, or any other of the usual substances employed to dissolve or soften caoutchouc. We do not confine our processes to the order above specified, as boiling or heating the vulcanized material in a solution of carbonated alkali alone will abstract the sulphur and leave the material in a workable condition, and lime-water or lime and hot water will in time fulfil the same purpose when used alone. But for economy we prefer the order as above stated. Neither do we restrict the practice of our invention to the use of the carbonate of soda or the carbonated alkali, for carbonate of potash will equally well abstract the sulphur, but it is not so economical as the soda salt. On the addition to the vulcanized caoutchouc of the solution of the carbonate of soda, carbonic acid is evolved, and sulphuret or polysulphuret of the alkali gradually formed, and this product can be applied to several useful purposes. But should the sulphur compounds thus formed with the alkali, and which are partly given off and liable to be diffused through the atmosphere during the operation, be found in any case to be objectionable, then we remedy this by adding to the hot solution, during the process, some metallic oxide, (as, for instance, oxide of copper,) or some metallic carbonate capable of forming with the sulphur as it is abstracted by the alkali, an insoluble sulphuret, by thus affixing the sulphur in a form of combustion that is unaccompanied by the disagreeable emissions given off by and peculiar to the alkaline and soluble sulphuret.

In producing the reactions between the sulphur of the vulcanized material and the alkali, or the lime, we do not confine the operation to the use in facilitating the process of hot water, or what is properly understood by a solution of the alkali, but in some cases find it advantageous to steam, or otherwise than by hot water, to heat the mixed materials; and for some purposes we vary these processes for effecting the union between the sulphur and the alkali, or the lime, by employing either of these agents in its dry state, or with only a little water present; and when mixed by any mechanical contrivance with the vulcanized india-rubber, steaming, or otherwise heating the mixture, and finally removing the sulphuret, so mixed, by washing with water.

To render vulcanized manufactured articles, or the refuse,

more soft and pliable, they may be advantageously washed in a solution of water and fuller's earth.

Now, what we claim as our invention is, the before-mentioned processes for removing sulphur from vulcanized india-rubber manufactured articles, and also from refuse or spoiled vulcanized india-rubber cuttings, parings, or old manufactured articles, and of re-dissolving the same for new purposes.—In witness, &c.

WILLIAM CHRISTOPHER.
GUSTAVUS GIDLEY.

Specification of the Patent granted to JOHN WILLIAM PERKINS, *of Narrow-street, Limehouse, in the County of Middlesex, Analytical Chemist, for Improvements in the Manufacture of Artificial Manures.*—Dated June 20, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists in fixing the salts and odorous gases usually contained in fœcal fish, or fish refuse, by the use and admixture of either sulphuric acid or hydrochloric acid, by which the nitrogenous matter contained therein will become fixed; and I prefer the admixture of both, which should be poured into a tank containing the fœcal, and then agitated in combination with the ammoniacal liquor from gas-works, or the liquor ammonia from animal charcoal, and is thus converted into a fixed salt, muriate or sulphate of ammonia, or nitrogenous matter, as the case may be. The mass should then be well stirred, so as to effect a combination of the salts and gases contained in the organic matters, after which an absorbent matter is added, consisting of gypsum, bone-dust, animal charcoal, sugar scum, appatites in fine powder, or native phosphate of lime, sulphate of soda, sulphate of potash, chloride of sodium, charcoal, or any of them, or a mixture of any of them, the quantity of free acid required being always sufficient to render the phosphates soluble. These matters are incinerated together in suitable ovens, heated to a temperature of from 200 to 800 degrees of Fahrenheit's thermometer, to render said matters sufficiently dry for commercial purposes; in which state the mixture is put into bags ready for use, and such mixture or artificial manure will be found to

possess greater fertilizing power than the artificial manures as hitherto manufactured.

In order to explain my said invention as completely as possible, I now proceed to describe the best means with which I am acquainted of practically working my said invention, together with the several matters or ingredients which I employ; and the mode of combining the same so as to produce artificial manure as follows:—

Description of the Processes.—Process No. 1.

I commence by making superphosphate of lime, by decomposing appatites, phosphorolites, coprolites, bones, or bone-ash, in hydrochloric acid, sulphuric acid, nitric acid, or any one of them, or a mixture of any two or more of them, and I propose employing such superphosphate of lime for the purpose of supplying that proportion of inorganic matter necessary for the development of vegetable life; and I would here remark that in making superphosphate of lime from any of the above-mentioned matters or ingredients, I prefer for the purpose of effecting such decomposition using a mixture of hydrochloric and sulphuric acid, in the proportion of about two-thirds of sulphuric acid to one-third of hydrochloric acid.

Process No. 2.

Another and better mode of making superphosphate of lime according to my said invention is as follows:—I take appatites, phosphorolites, bones, bone-ash, or any of them, or a combination of any of them, and placing them in a reverberatory furnace I heat them to a dull red heat; and whilst in that state I combine them with the acids above mentioned, or any one of them, or a mixture of any two or more of them, in the manner usually practised of making superphosphate of lime, and in this manner and by these means I produce superphosphate of lime. But in using the said acids, I prefer using the mixture and in the proportions described in process No. 1. And I employ the superphosphate of lime obtained by either of the above-mentioned processes as a powder, after being reduced to that state by any of the known means for effecting the same, for the purpose of causing the absorption of night-soil, fish, or fish refuse, or other organic matter, previously decomposed by the application of sulphuric acid, or any other of the above-mentioned acids, or any mixture of

them, in the proportion of about ten per cent. thereof, and thus I produce superphosphate of lime compost.

Process No. 3.

Another part of my said improvements consists in decomposing or carbonizing night-soil, fish, fish refuse, or other organic matters, by the use of large quantities of hydrochloric acid, sulphuric acid, nitric acid, or any one of them, or a mixture of any two or more of them, and thereby to produce superphosphate of lime compost, dried by the addition thereto of appatites, phosphorolites, coprolites, bones, bone-ash, or any one of them, or a combination of any two or more of them. And to the said superphosphate of lime compost, whether made under this process, or under processes Nos. 1 and 2, I apply and combine soluble silica, converted by any of the known means into silicate of soda, or potash, from the silica, such as is found in the neighbourhood of Farnham, or elsewhere, for the purpose of supplying a natural deficiency in most soils, namely, that due proportion of silica in a state of solubility, necessary for maintaining heavy crops in an erect position, and thereby I obviate the predisposition which all plants have to "lodge," when in a high state of cultivation.

Having now described the nature of my said invention of improvements in the manufacture of artificial manure, and the means by which the same may be effected, I declare my invention to consist in, and I claim,

First, the producing superphosphate of lime in the manner and by the means hereinbefore particularly set forth at processes Nos. 1 and 2, and the use and employment thereof in and for the manufacture of artificial manure in the manner set forth and described.

Secondly, in the mode set forth at process No. 3, of manufacturing artificial manure by producing superphosphate of lime compost direct, by the addition thereto of appatites, phosphorolites, coprolites, bones, bone-ash, or any one of them, or a combination of any two or more of such said matters or ingredients, and the combining therewith of soluble silica converted into silicate of soda, or potash, for the purpose set forth.—In witness, &c.

JOHN WILLIAM PERKINS.

Specification of the Patent granted to CONRAD WI
FINZEL, *of Bristol, in the County of Somerset,*
Refiner, for an Improvement in Refining Sugar.—
May 7, 1853.

To all to whom these presents shall come, &c., Whereas it has hitherto been the practice to melt sug means of steam injected into the pan containing the or otherwise in open pans, whereby much fuel is consu a large proportion of treacle is formed, while from melting the sugar becomes coloured: now my imp ment consists in melting sugars *in vacuo*, whereby a less quantity of treacle is produced, and the sugars are better colour than those melted in the ordinary manne

For the melting of sugars I employ an ordinary va pan, the construction and working of which being understood, renders any particular description fron unnecessary.

I do not limit myself to any form or size of By melting sugars *in vacuo* the melting takes place much lower temperature than by any of the processes followed. The sugar is not liable to damage from he it is not long in contact therewith, and a great savi time is effected.

And having now described the nature of my said inve and in what manner the same is to be performed, I d that I claim the melting of sugar *in vacuo*.—In witness

CONRAD WILLIAM FINZ

Specification of the Patent granted to HENRY CONSTA
JENNINGS, *of Great Tower-street, in the City of Lo*
for Improvements in the Manufacture of Soap.—
May 2, 1853.

To all to whom these presents shall come, &c., This invention consists in converting stearine into so means of a carbonated alkali with heat, instead of empl a caustic ley or alkali, together with long boiling. I combination with stearine obtained from palm-oil t or any other vegetable or animal substance that stearine, such portions of common fat or rosin, or substance or substances when desired, as shall ter cheapen and produce the more common kinds of s

The result of the process is to obtain a harder and more neutral soap, and at a less expense.

Having thus stated the nature of my said invention, I will proceed to describe the means pursued by me.

Combine one thousand pounds of stearic or margaric acids, as free from eleain or oleiane as possible, or palmatine, or any vegetable or animal stearine or margarine, at the temperature of two hundred and twelve degrees, Fahrenheit, with a solution of bicarbonate of potassa or soda, which solution shall have a specific gravity of about one thousand five hundred degrees; constantly stir or mix until an intimate combination is obtained, and that the elements will not part when tried upon glass or any other similar substance (which will possess on or about six and three-quarters per centum of alkali); when the mass is cooled down to about sixty degrees, Fahrenheit, add one pound per centum of aqua ammonia; of about eight hundred and eighty degrees specific gravity, and one pound per centum of the strongest solution of caustic potassa; these are to be added gradually, and fully mixed or stirred until perfectly combined. Dissolve fifteen to eighteen pounds per centum of common rosin of commerce, by boiling it with a solution of subcarbonate of potassa and common soda of commerce, in equal parts, or as much as will give the solution a specific gravity of or about one thousand eight hundred degrees when boiling hot. Mix these perfectly with the above-recited stearic or margaric acids, and carbonated alkali, as recited, then add a strong solution of caustic potassa or soda until a perfect saponification is produced; the dose of caustic alkali will much depend upon the purity of the stearine or margarine employed. The separation is now effected by using common salt or sulphate of soda, &c., as is known and practised by soap-manufacturers. If the soap intended to be produced is to be colourless, no rosin must be employed, and a larger dose of aqua ammonia and caustic alkali must be used according to the dryness of the stearic matter to be operated upon.

I claim the use of carbonated alkali, whether vegetable or animal, in combination with stearine or margarine palmatine, or any other similar substance whatever, and aqua ammonia for the production of soaps, and effecting saponification at a low temperature by these combinations.—In witness, &c.

HENRY CONSTANTINE JENNINGS.

Specification of the Patent granted to HERBERT TA
of Mark-lane, in the City of London, Merchant
Improvements in Ornamenting Surfaces of Fabrics,
cable to various useful purposes, such as for Cove
Furniture, Imitation Tapestry, Carpets, or Hangin
Dated April 9, 1853.—(A communication.)

To all to whom these presents shall come, &c., &
The invention which has been communicated to me b
foreign correspondent as aforesaid, and for which I
obtained letters patent, consists of an improved meth
painting or ornamenting cloths of all kinds which
been previously prepared with a mordant that will con
chemically with the colours as they are laid on and ble
one with the other. The invention further includ
method of developing and permanently fixing the co
thereon by steam, and restoring the cloth to its na
pliable and soft condition, by washing out the e
of colouring matter, and leaving the picture indelibly
in the cloth. To enable others skilled in the art to
and use the invention or discovery, I will proceed, firs
explain what has heretofore been done, and next to des
the difference between such known processes and
I claim as a new discovery in the art.

The printing upon cloths by blocks or rollers is
known, the cloth having been previously prepared w
mordant, for fixing chemically the colours. But with b
or rollers only one colour can be laid on the cloth,
no blending can be done, for two reasons, viz., that
second colour destroys the first in a great measure, an
mordants used, exhaust their chemical effect upon the
colour, and would not act upon the succeeding ones.
is also admitted that colours laid on by blocks and r
have been treated with steam for brightening and f
them in the cloth.

Another method of ornamenting or painting, as
canvas in oil colours, or upon velvets and satins in
colours, is equally well known; but in neither of
latter cases are mordants or chemical colours used, no
the colours permanently fixed in the material so pa
upon. Besides, such pictures are merely ornamental,

cannot be applied to useful purposes, as the pliability of the cloth is lost; and the picture or ornament being upon the surface and not in the body of the cloth, it will be easily understood that to apply a fabric so ornamented to any useful purpose would entirely destroy it.

The present discovery may be considered as combining the permanency of the first with the beauty of the second of the above-described methods. What the artist puts upon the surface of his canvas, and which is merely ornamental, I put into the body of the fabric in permanent colours, then restore the cloth to its natural pliable state or condition, and produce an article both ornamental and useful. The present invention is applicable to the making or ornamenting of table or piano covers, floor cloths, tapestry, pictures, or portraits, chair and sofa covers, window curtains or blinds; and in its practice I can lay one colour over another, or blend them, with the same facility that oil colours can be laid on or blended on canvas. The laying of chemical colours in or on cloth in this manner, so as to preserve them all, has not to the best of my knowledge been heretofore known or used.

In the practice of the present discovery, I find it equally applicable to silks, satins, velvets, woollen or cotton goods, and may be executed in imitation of Gobelin tapestry, or pictures or faces from nature. To paint on felt or woven woollen goods, I proceed as follows:—The cloth is first perfectly bleached, in the ordinary manner, with soap and sulphur; a tepid water-bath is then prepared, into which is placed, as a mordant, bisulpho-hydrochloride of tin, until the liquid weighs three degrees of Beaumé (acid weight). This mordant is composed of hydrochloric acid, sulphuric acid, and block tin, in about the proportion of eighteen pounds of the first, nine pounds of the second, and two and a-half pounds of the third, the whole being warmed in a sand bath, during which chlorine gas is to be introduced, by a pipe or otherwise, to saturate the solution. Into this mordant the cloth is placed, and allowed to remain about three-quarters of an hour, when it will be sufficiently charged with the mordant to receive the chemical colours to be laid on or painted upon it, even when one colour is laid on over the other to the extent of several colours, the mordant retaining its power of taking and holding the quantity of colour necessary to give depth and richness to the picture. After the cloth is taken out of the

mordant it is wrung out, and the creases carefully sh
out, and, after a period of about ten minutes, shoul
placed in a liquid prepared with twenty parts cold wat
one part of clear chloride of lime water, at two and a
degrees Beaumé, where it is allowed to remain about
minutes, after which it is washed in clean water and t
out and dried.

This operation will prepare the fabric for receiving
colours. The primitive colours which I use are var
being chiefly vegetable, but I also use some mi
and some animal colours; and the various shades th
are made by mixing the colours, or reducing them
gum water prepared from the gums arabic or sen
which should be well bleached or purified and diss
in water. By mixing or commingling the prim
colours, any other tints may be produced, according t
taste of the artist; and these mixed colours may be fu
reduced in shade by reducing with gum or other water.
may be proper to state that the mordant which I u
entirely colourless; and as I use cloth as white as it ca
made, so as clearly to show the finest tints, it is impo
in the practice of the art, inasmuch as a mordant prep
of sulpho-muriate of tin is tinged with yellow, and im
its colour to the cloth. The picture should be comme
with the lighter shades first, and finished with the da
ones, allowing each colour, after it is put on, to dry b
another is put over it; and thus great richness is give
the picture which is being painted on the cloth, whils
mordant retains its chemical affinity for the colours,
fixes them permanently in the cloth successively as the
laid on.

The most expeditious and economical manner of put
on the figures or designs is to have the outline, or so m
of the figure as may be necessary, lithographed, and s
on to the cloth, by which means any number of co
of the same design may be produced, and which
obviate the necessity of employing artists to sketch out
figures; for with a copy before the operator, and the
line established, the colours may be easily blended in.

As yet, not having largely entered into the manufac
of this new article or this new art, and, indeed, no fur
than to fully and completely establish the feasibility of
operation, I use very crude instruments for putting on
blending the colours, and which time and experience

greatly improve or change; but as I have accomplished the object with them, any others more neatly made may be considered only as their equivalents. I use, for the purpose of sketching in the figures (when not lithographed), and for many of the sharper lines, a gold or common quill pen or style, a brush, and a small roll of felt or other cloth; and sometimes, for pressing or working in the colours more deeply into the cloth, I use a small piece of wood, ivory, or glass, which may be easily cleaned, and not affected by the colours.

I may here state that up to this part of the operation the colours are neither fully developed, nor permanently fixed, nor set; and that, after the figure, landscape, design, or ornament of any kind is fully painted on the surface, the cloth is stiff with the gum and colours, and it must then be rolled in a damp cloth, or laid between damp cloths to soften and moisten it. Each piece is then separately rolled in a clean white cloth, and suspended in a steam chamber, so that the rolls shall not touch each other, or the sides of the chamber. This is necessary, to prevent the colours from running or mixing with each other.

The steam chamber being tightly closed, the steam is allowed to enter the chamber, and the rolls or cloths to remain therein from forty-five to ninety minutes, or in proportion to the bulk or size of the piece to be operated upon.

This steaming may require one, two, or more separate operations; although, as a general thing, for small articles, one will serve the purpose.

When two operations are necessary, the rolls or goods should be turned upside down, or reversed end for end, to prevent the colours from running; this may be more economically done by machinery, from the outside, as it may be found necessary to keep the rolls in continual motion in the chamber, and it would obviate the necessity of opening the chamber, or handling the hot rolls or goods while being steamed. After the painted cloths are properly steamed for brightening and fixing the colours thereon, they are taken out and exposed to the air for twenty-four hours, more or less, to dry, and to allow such of the colours, as blue and green, which require the re-oxygenation of the air, to be brightened, and to give them life, and fully develop themselves. Smaller articles will, of course, require less time.

After the steaming and drying operation, the fabrics are allowed to lie in clear water, until the gum therein dis-

solves; after which they are dipped up and down in the water, until the colour ceases to run; and for this purpose a running stream of water is the best.

When well washed or rinsed, as above, they are rolled in a clean white towel or cloth, and beaten by the hand, or otherwise, to drive out the water; and if any colour remains in the towel, wash and dry it again, until the excess of colouring matter, or that which the mordant has not combined with, is entirely washed out; brush the fabric lightly with the grain of the cloth, and put a piece of white paper over it, and iron it with a moderately hot iron, being careful not to scorch or injure the cloth or colours. The colours are now fully developed, and permanently fixed or set, and the article is ready for the market.

Many modifications of the general plan of operations above described may be developed by experience, and much of the manual labour may, perhaps, be performed by machinery. I wish it to be understood, therefore, that I do not intend to confine myself to the precise process or manipulation herein set forth, but to modify the same according to circumstances, so long as I retain the general principles of the operation herein set forth.

I again repeat that the present invention differs from block or roller printing in this: that by blocks or rollers one colour cannot be put upon another; that for each separate colour a separate block or roller must be used. In this invention, however, the colours may be laid one upon another, with the same implements, at pleasure, and to any extent, preserving the tints of all, and giving tone to the picture. It differs from oil painting on canvas, or water painting on silk, satin, or velvet, as these are on the surface, and are therefore perishable, and therefore the articles or fabrics to which they are applied can only be ornamental, whilst in the fabrics ornamented by the improved process the colours are in the body of the cloth, and imperishable, and therefore the fabrics may be both ornamental and useful.

Having thus fully described the nature of this new and useful discovery, what I claim therein as new, and desire to secure by letters patent, is the painting upon cloth previously prepared with a mordant, as herein described, that will combine chemically with the colours laid on, one over another, and blended as described, by which I give great richness to the figures, whilst the tint of each is carefully

preserved. I claim, also, developing and fixing permanently the colour by steam, and restoring the cloth to its natural pliable state, by washing out the gum and excess of colouring matter, as herein described.

Any ordinary steaming apparatus will serve the purpose, such, for instance, as are used for steaming worsted goods, merinos, cashmeres, and other similar fabrics. The chloride of lime water is used to oxidate and combine the mordant of tin with the cloth.—In witness, &c.

HERBERT TAYLOR.

Specification of the Patent granted to GEORGE ROBB, *of Glasgow, in the County of Lanark, North Britain, Veterinary Surgeon, for Improvements in the Manufacture of Sulphuric Acid, Alkalis, and their Salts.*—Dated April 2, 1853.

To all to whom these presents shall come, &c., &c.—My said invention relates to the manufacture or production of sulphuric acid, sulphate of soda, sulphate of potash, and sulphurets of sodium and potassium and their carbonates, so as to secure superior economy in the several processes. In making sulphuric acid, the vapour of sulphurous acid is passed over or in contact with the per-oxide of iron, manganese, or other metals, with or without the addition of clay or alumina, mingled with heated air; and this produces sulphuric acid. But in order to obtain the essentially necessary superior heat, carbonic oxide in a state of combustion, or the products of combustion of any clear bright burning body, are passed through the materials, so as to ensure a superior result. To produce sulphates of soda and potash, the sulphurous acid is passed along with heated air and steam over a mixture of common salt or chloride of potassium and per-oxide of iron, manganese, or other oxide, and with or without clay or alumina, as hereinbefore mentioned; the direct heat of any clear burning body, as hereinbefore mentioned, being also used in this part of the process. In making the sulphurets of sodium and potassium, for the production of the carbonates of soda and potash, the sulphates of soda and potash are mixed with the sulphates of lime, barita, strontia, magnesia, or other sulphates, or the sulphurets of these bodies, or soda waste,

either individually or mixed. The carbonic acid gas may be obtained from bi-carbonate of soda or potash which has been made with carbonic acid by a process of combustion. And in order that my said invention may be properly understood, I shall now proceed to explain the details of my several improvements.

In employing oxide of iron for the production of sulphuric acid, I use by preference the pyrites cinder, resulting from the combustion of iron pyrites, as commonly produced in the manufacture of sulphuric acid at present. When oxide of manganese is used, any of the ordinary manganese ores of commerce may be thus employed. The pyrites cinder or oxide of manganese is first reduced to a coarse powder, and it is then commingled with about from one-fifth to one-tenth of its weight of common clay or argillaceous earth; or, instead of this added matter, alumina may be used. The compound so made is then made up into a paste with water, when it may be moulded into balls, bricks, or suitable manageable masses. As the special nature of the incorporated materials necessarily varies occasionally, the proportions which I have stated are also equally variable; and in some instances I prefer to mix a quantity of ground coke or charcoal, or small coal, in the mass, so that as this carbonaceous addition burns out in the subsequent calcination of the balls, the masses will be left in a more highly porous condition, and better suited for the purpose intended. Such bricks or masses are then dried in a common stove, until they are hard and difficult of fracture. In this state they are placed in a furnace resembling an ordinary lime-kiln, or what is technically known in Scotland as a "draw kiln." Round this kiln are ranged a set of pyrites burners, such as are in ordinary use by sulphuric acid makers. These burners are so arranged that all the products of the combustion effected in them may pass into the composition kiln. Common pyrites is deposited in these burners, and roasted in the usual manner, highly heated atmospheric air being at the same time admitted at the bottom of the composition kiln. By this arrangement the sulphurous acid vapour and the oxygen of the atmosphere, being simultaneously brought into contact with the composition masses or bricks at a dull red heat, the resultant combination forms sulphuric acid. During this process, carbonic oxide or other cheap combustible gas may be advantageously introduced at

different parts of the composition kiln, so that the kiln may be still better heated throughout. The admission of surcharged or super-heated steam is also advantageous; and instead of using pyrites in this way as the source of sulphurous acid, I use as well sulphur, sulphuretted hydrogen, or artificial sulphuret of iron; or the sulphurous acid employed may be obtained from any known source. In making sulphate of soda, by passing sulphurous acid over oxide of iron, or manganese and common salt mixed together, and retained at a dull red heat, the preferable oxide of iron is, as I have already described, the spent cinder from pyrites burners; or manganese, which may be used over and over again, may be similarly employed. I make up the salt and oxide into balls or bricks with clay or alumina, and then introduce such masses into a kiln, such as I have already described, passing the sulphurous acid through them. Any artificial mode of heating may be used, but in the case of pyrites this is unnecessary. The whole of the common salt is readily decomposed in this way. If steam or moisture is admitted into the kiln, along with the atmospheric supply, muriatic acid is given off; but if the air and the materials are thoroughly dry, chlorine gas is evolved by the process.

In manufacturing carbonate of soda, I first produce a sulphuret of sodium, and then decompose such material by the action of carbonic acid. The ordinary sulphate of soda is, in this process, decomposed by the action of suitable carbonaceous material in a kiln or common furnace; but I add to the sulphate of soda a portion of sulphate of barytes, or strontian, or lime, or magnesia, or other sulphate or sulphuret; or a mixture of these said materials, or ordinary vat waste from the alkali makers, mixed with one or other of these compounds. By the agency of such additions I obtain a sulphuret of sodium, which does not corrode the furnace or the iron tools nearly so rapidly as when the sulphate of sodium is decomposed by itself with carbonaceous materials; and it is with this object that I use these hereinbefore described mixtures. The result of this process is that an easily lixiviable mass is obtained, and the residue may be continuously used over and over to assist in the decomposition of fresh sulphate of sodium. Such sulphuret may be decomposed by the action of bi-carbonate of soda, according to the process for which letters patent for England were granted to Mr. J. Wilson, in the

year 1840. But I especially use the bi-carbonate of soda as a source of carbonic acid for effecting the decomposition of sulphuret of sodium, placing the bi-carbonate of soda in a separate vessel or chamber, and generating the carbonic acid by the agency of heat. The bi-carbonate may be produced by causing the common carbonate of soda to absorb the products of the combustion of carbonaceous materials. In practising this process, the sulphuretted hydrogen evolved may either be turned into sulphurous acid, for the production of sulphuric acid, or its sulphur may be recovered by heating it to redness, or by passing it into a chamber where it meets with sulphurous acid. Or it may be made available by other known methods, which must be obvious to the practical chemist.

Having now described and particularly ascertained the nature of my said invention, and the manner in which the same is or may be used or carried into effect, I may observe, in conclusion, that I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of my invention; but what I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited letters patent, is,—

First, the general arrangements and means for manufacturing sulphuric acid, alkalis, and their salts, as hereinbefore described.

Second, the application and use of powdered pyrites cinder, oxide of iron, or oxide of manganese, formed into masses with clay or alumina, for the purposes hereinbefore described.

Third, the system or mode of keeping up the heat of the kiln or furnace by the use of heated air, by carbonic oxide or other cheap combustible gas, or heated products of combustion.

Fourth, the decomposition of common salt in a state of admixture with oxide of iron, pyrites cinder, or oxide of manganese, by passing the vapour of sulphurous acid through such compound.

Fifth, the system or mode of operating upon pyrites for the production of sulphuric acid, wherein the heat employed is solely derived from the combustion of the pyrites.

Sixth, the application and use of bi-carbonate of soda as

the source of carbonic acid for effecting the decomposition of sulphuret of sodium, and the mode hereinbefore described of decomposing the sulphuret of sodium.

Seventh, the application and use of sulphates of lime and the other agents hereinbefore mentioned, in the reduction of sulphate of soda to sulphuret of sodium, whereby an easily workable mixture is obtained.—In witness, &c.

GEORGE ROBB.

Specification of the Patent granted to AUGUSTUS BRACKENBURY, *of Camden-town, in the County of Middlesex, Gentleman, for Improvements in Precipitating the Muriate of Soda from its Solutions in Water.* — Dated May 6, 1853.

To all to whom these presents shall come, &c., &c.—My invention of improvements in precipitating muriate of soda from its solutions in water consists in the direct application of air or gas to such solutions, whereby the aqueous part is evaporated, and the muriate of soda thus caused to precipitate.

In separating muriate of soda from its solutions in water, hitherto it has been usual to place the solution in pans, and by the application of heat to the pan or containing vessel to evaporate the aqueous portion; in contradistinction to which I apply the heating medium direct to the solution, without the intervention of any substance.

In carrying out my invention several modes of operation may be pursued; according to one method I place the solution in a wooden tank or other vessel of large superficial area in order to expose a great extent of surface, on which I cause the evaporating agent to take effect. For this purpose I place a disc of wood or other plane surface so as to float on the surface of the solution.

The specific gravity of wood renders it well adapted for the purpose, but other materials may be used, taking care to render them sufficiently buoyant in themselves or by counterbalancing. The floating disc should nearly equal the area of the tank, and is made with an opening in the centre, over which an inverted chamber is placed, and rises some three feet above the disc. This chamber is rendered

close above the disc, the only ingress or egress being
below the disc or float. The float rises and falls wi
level of the solution, and should have suitable gui
maintain its parallelism of motion, and keep it in its
tion in the tank. A tube rises up from the bottom
tank or containing vessel into the inverted chamber,
tube being of sufficient height as to be at all times
the surface of the solution. This tube is for the pu
of introducing the heated air or gas which is to effe
evaporation of the fluid. The air is heated to a
degree for evaporation by passing it through heated
or over coke or other suitable fires; it is then forc
pumps or other suitable means through the rising tu
the tank into the inverted chamber occupying the ce
the disc. The pressure thus created in the chamber
on the surface of the solution in the tank, causing th
or floating surface to rise, and the fluid in the cham
be depressed, until the air escapes below the disc.
way the air passes off rapidly in every direction fro
inverted chamber, thus spreading a thin film of heat
over the area of the tank, which air is thus kept in
contact with the solution. The air having travelled
the centre of the disc to the periphery escapes then
the atmosphere, and being thus kept in close contac
the solution for a considerable time, it rapidly absorb
carries off the aqueous portion thereof. The evapo
of the aqueous part necessarily causes the muriate o
to deposit in the bottom of the tank. By continui
action of the heated air the whole of the aqueous
the brine may be driven off with equal facility; th
accommodating itself to the varying level of the
always insures a uniform effect. Instead of the i
tube rising in the tank, the air may be conducted th
a flexible or sliding tube, carried in at the top of th
persion chamber.

Another mode of evaporating water holding muri
soda in solution, according to my invention, consists
application of a revolving drum for the purpose of ex
a thin film of the brine to the action of the heated
other vehicle of caloric. For this purpose I place th
tion of muriate of soda in a wooden or other tank of s
size, and erect over a drum, having its axis horizonta
in such elevation that the periphery of the drum
slightly into the brine below. The supply of brine

be regulated so that it maintains as near as possible a uniform level in the tank, which in this case need not be of much greater area than the space occupied by the drum. The drum is composed of two or more circular discs or frames supported from the axis, and having suitable stays between the peripheries of each. Woollen or cotton cloth is stretched between the circular frames, and forms the periphery of the drum, which dips into the solution. The sides of the drum are thus enclosed, with the exception of an aperture in the centre on one side. The drum should be overhung in its bearings from the opposite side. A rotatory motion is given by its axis on one side, while a central aperture is provided at the other, whereby to introduce heated air for the purpose of evaporation as hereafter described. The air, which may be heated by passing through pipes, or over a coke or other incandescent fire, is forced into the drum with a slight pressure, the drum having at the same time a slow rotatory motion imparted to it while dipping in the brine. The cloth of the periphery dipping in the tank becomes saturated with and carries up a quantity of the brine, which, as it rises, becomes exposed to the action of the heated air in the interior. The rarefaction of the air, and the slight pressure exerted in its introduction to the drum, causes it to ascend and pass through the meshes of the cloth, during which it absorbs the aqueous part of the solution, which is thus rapidly driven off, and the muriate of soda left in the cloth. As the rotation of the drum progresses, this deposit of the salt will be carried down into the solution below, becomes washed off, and deposits in the bottom of the tank. The brine being thus acted on in very small quantities, and exposing a large surface to the direct action of heated air or other evaporating medium, great rapidity of evaporation is effected. The motion of the drum, and the transmission of the heated air, may readily be adjusted so as to utilize the whole of the heat.

Instead of introducing the heating medium into the drum as aforesaid, the heat may be generated in the drum by the combustion of gas. The air duct remains as before for the admission of air to the drum at the centre. The gas is admitted also at the centre by a suitable pipe, and ignited at several small jets, at a sufficient distance from the upper part of the cloth periphery to prevent contact or

injury by the flame. The combustion of the gas r and heats the air inside the drum, which ascends th the saturated cloth with the effect before described. passage of the heated air may be facilitated by introd the air to support combustion under as light pressu means of a fan or other suitable apparatus.

Having described the nature of my invention, an manner in which it is to be performed, I would h understood that what I claim is, the several mode arrangements of apparatus for evaporating the aq part of solutions of muriate of soda, and facilitatin deposit of muriate of soda, as hereinbefore describe witness, &c.

AUGUSTUS BRACKENBU

Specification of the Patent granted to PIERRE AMAB SAINT SIMON SICARD, *Chemist, of Paris, in the R of France, for Improvements in enabling Persons main under Water and in Noxious Vapours.*— August 26, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., The invention consists,

First, of a combination of apparatus for enabl person to remain for a length of time under water noxious vapours, without the necessity of being conti supplied with air by means of pumps, as has hitherto usually the case.

Secondly, of a lamp for the use of the diver, also pendent of a supply of external air; and

Thirdly, of apparatus for raising and lowering the and for containing his tools. And in order that the tion may be most fully understood and readily carrie effect, I will proceed to describe the annexed drawing

Description of the Drawing.

Fig. 1, shows a waterproof dress for the diver.

Fig. 2, his helmet and cuirasse, with a box cont the materials for supplying and purifying the air.

Fig. 3, shows the diver completely clothed and equi

Fig. 4, is another view of the back portion of the cuirasse, shown in fig. 2.

Fig. 5, shows the girdle of the diver, with the weights, which serve as ballast, attached.

Fig. 6, is a back view of fig. 5.

Fig. 7, is a side view, partly in section, of the air-supplying-box, shown in figs. 2 and 6.

Fig. 8, is a side view of a lamp for the diver.

Fig. 9, is the same partly in section.

Fig. 10, is a plan; and

Fig. 11, shows a seat in which to raise and lower the diver.

The dress, fig. 1, has an opening at the neck and a slit in front, through which the diver enters, but this slit can be closed and made waterproof by means of the screws, *c*, *c*, which bring the metal edges of the slit into close contact, as is best seen in fig. 3. The opening at the neck, *a*, is also closed so as to be watertight round the groove, *d*, at the lower part of the helmet by means of a binding screw (seen at *d*, fig. 3), which clamps the metal ring at the neck of the dress tightly around the ring on the helmet. The helmet, fig. 2, is of metal, and is nearly spherical in front; it has three glasses inserted in front, the centre one is round, and the two side ones are of an oval form; it has a valve at the top to let out any impure air if necessary; it is also furnished with two tubes, v and c^1, the use of which will be hereafter explained. The cuirasse consists of two parts to enable the diver to enter; the one in front is marked *l*, the one behind l^1; they can be fastened together with a sort of hinge-joint, with a moveable pin, as shown in figs. 2 and 4.

The box or knapsack, which the diver carries on his shoulder, is divided into two compartments. The one, *r*, is divided by means of pipes and plates, as shown at *x*, fig. 7, in such a manner as to cause the air which enters by the pipe, *y*, to traverse it from top to bottom many times before it again issues by the pipe, b^1. The passage, f^1, which is closed by a screw-plug, when the apparatus is in use, is for the purpose of emptying and cleaning the machine; a similar passage at the top, e^1, is for the purpose of introducing the chemicals with which the vessel is to be charged, which must be of such a nature as rapidly to absorb carbonic acid: but I prefer to use a mixture of subacetate of lead with caustic potash, the intention being to absorb the

carbonic acid which the man forms in breathing; the compartment, *s*, is for the purpose of containing oxy a pressure of about twelve atmospheres; it is fill means of a force-pump through the tap, g^1, which cover, *t*, to protect it when the apparatus is in use. oxygen is drawn out of this vessel for use by means small cock, *h*, which is turned by means of an endless which is in connexion with the rod, k^1, by means of the diver regulates the quantities of oxygen. After p the tap, h^1, the oxygen passes by the small tube, *d* the tube, b^1, just as it leaves the absorption compar Thus the contaminated air which leaves the helmet tube, *v*, loses its carbonic acid in the vessel, *r*, after it passes through the tube, d^2, and is again supplie oxygen, and returns by the tube, c^1, in a fit state again respired.

The girdle, fig. 5, consists of three pieces of which are jointed together, and fastened in front by of the screw, *n*; to this girdle is attached the weights, *q*, *q*, the weight of which will depend on the to which it is desired to descend. The cords, *p*, *p*, pas the shoulders, and are fastened in front by means rings, *i*, *i*.

The lamp, fig. 9, consists of a chamber, A^1, wh filled with compressed oxygen and hydrogen throug cock, N; the mixed gases issue through the co (which is turned from the handle, P, by means of an e screw), through a safety apparatus, B, consisting of s thicknesses of wire-cloth, and afterwards is caused t frequently through water contained in the tubes, gases again pass through wire-cloth at D, and then p the burner, G, where they are ignited in contact with a of pure lime contained in a spiral of platinum wire, a in H. The lantern, I, is closed at J, by means of a which is retained in its place by a ring of metal, wh screwed into the circular hole in the lantern. The which is formed by the combustion passes out at K the tube, L, which is bent into a serpentine form to in the surface in contact with the external water, by means the steam is partially condensed, the conden being completed in the condenser, M, which is furn with two valves, T and U, the former being used to l any uncondensable gas which may accumulate, an latter to let out the condensed water after use.

The chair, fig. 11, consists of a seat, v, perforated with holes to enable the water to pass through with facility; it has also a foot-board, x, and two boxes at the sides, y, y, which may be used for containing tools; the whole is raised and lowered by means of a rope attached to a ring on the top of the upright bars, z, z.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would remark that the diver's dress is for the most part similar to what has before been used. I do not, therefore, claim the same.

But what I claim is,

The combined apparatus herein described for enabling a person to remain under the water, or in noxious vapour and gases, without being supplied with air from the surface of the water or from the external atmosphere; and I also claim the combination of apparatus for enabling a lamp to burn under the water.—In witness, &c.,

PIERRE AMABLE DE SAINT SIMON SICARD.

Enrolled February 26, 1853.

***Specification** of the Patent granted to* ROBERT WALTER SWINBURNE, *of South Shields, in the County of Durham, Glass Manufacturer, for Improvements in the Manufacture of Glass.*—Dated May 3, 1852.

To all to whom these presents shall come, &c., &c.—My invention consists of a mode or modes of casting or manufacturing glass or other vitreous material in a melted state, by means of cisterns or casting vessels, which are placed in the furnace or kiln whilst being filled or charged from the melting pots, for the purpose of avoiding the diminution of the heat of the melted glass or metal before casting, which is consequent upon the ordinary mode of casting plate-glass. And the manner in which I carry my said invention into effect is as follows:—Near to each melting pot in a furnace I place a cistern or casting vessel, of such a size that, when filled, it can be conveniently removed from the furnace, and taken to the casting table. And I place each cistern close to the melting pot from which it is to be filled or charged, in order that the melted glass or vitreous metal contained in the melting pot, or a

portion of it, may be transferred without waste, by a ladle or other convenient means from the melting pot into the cistern. When the pots contained in a furnace have been charged, and the glass or vitreous material in them has been melted, and is ready for use, I transfer, by means of an iron ladle or other convenient implement, from each pot, into an adjoining cistern or casting vessel (which must be previously heated in the furnace), a sufficient charge or quantity of the melted material; the cistern into which the melted material is thus transferred remaining in the furnace or kiln during the whole time that the operation of charging it is going on, and until the workmen are ready to take it to the casting table. A cistern or casting vessel being thus charged, and the casting table ready, the workmen withdraw the cistern from the furnace, and take it quickly to the casting table, and cast the contents of it upon the table, and roll it into sheets or plates in the usual way, and immediately return the cistern to the furnace, and place it near to the same or some other melting pot ready to receive another charge, to be dealt with as above described.

I continue to transfer the melted material from the melting pots into the casting cisterns, and to cast the same into plates or sheets of glass or vitreous material, in manner above described, until the whole charge contained in each of the melting pots in the furnace has been exhausted, after which the pots are to be refilled and heated until the contents of them are ready for casting as before.

I have described my mode of making glass as applicable to a furnace containing several melting pots, but it may of course be used in a case in which only one melting pot is placed in a furnace. And, although I have mentioned the use of a casting cistern or vessel for each melting pot in a furnace, one casting cistern may, if preferred, be used for two or more melting pots. And with reference to the furnaces or kilns in which the melting pots are to be placed, the same may be of the ordinary or any other improved construction which may be convenient for the purpose of melting and preparing the glass or material, but the furnaces must be furnished with convenient apertures through which the casting vessels may be with facility introduced into and withdrawn from them, and they must also be furnished with doors or other convenient means for closing such apertures when they are not required to be open. The melting pots may be the same as those which are ordi-

narily employed for the melting of the materials used in the manufacture of glass.

Having now described the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim as my invention is, the mode or modes of casting or manufacturing glass or other vitreous material, by means of casting vessels which are placed in the same furnace with the melting pot whilst being filled in manner and for the purposes hereinbefore described.—In witness, &c.

ROBERT WALTER SWINBURNE.

Specification of the Patent granted to GEORGE TURNER, *of Bradley-terrace, Wandsworth-road, and* ROBERT HOLLOWAY, *of Saint James's-street, Hatcham New-town, Old Kent-road, for Improvements in the Manufacture of Unfermented Bread, which Improvements are also Applicable to other Purposes as a Substitute for Yeast.*—Dated April 27, 1853.

To all to whom these presents shall come, &c., &c.—Our invention relates to the use and application of certain vegetable matters or ingredients, and the combining and mixing together of the same, so as to form a preparation or mixture, which we propose using as a substitute for the yeast of commerce, such as is commonly used in and for the manufacture of bread, biscuits, puddings, and a variety of other purposes to which yeast is applicable.

And in order to explain our said invention as completely as possible, we now proceed to describe,

Firstly, the matters or ingredients which we employ in the manufacture of the above-mentioned preparation or mixture.

Secondly, the proportions thereof which we have found well adapted for the purposes of our said invention; and

Thirdly, the order and manner of mixing or incorporating such said matters or ingredients together, so as to obtain the most beneficial results therefrom.

We now proceed to describe the ingredients and proportions thereof which we employ in the manufacture of the aforesaid preparation or mixture, according to our said invention.

We take of the tartaric acid of commerce, 120 lbs. we
Bicarbonate of potash . . . . 144 „
Loaf sugar, pounded . . . . 30 „
Finest Patna rice, ground fine . 116 „
East India arrow-root . . . . 30 „

Or, should arrow-root not be easily obtainable, we employ, in lieu thereof, about 60 lbs. weight of the Carolina rice, ground fine; and we mix and incorp these matters or ingredients intimately together in a able vessel, in the following order and manner, that say:—We first mix the tartaric acid with the Patna and then pass these ingredients through a fine siev about gauge No. 60), or through a machine such as is monly used for dressing flour through; and having this, we let this mixture stand for twenty-eight days dry situation, to allow the acid to be well coated by rice, previous to mixing with the following ingredi We next mix the East India arrow-root, or Carolina (ground fine), with the bicarbonate of potash and pou sugar, and let this mixture also stand for twenty-eight in a dry situation, for the purpose above mentioned. which time we mix and incorporate the whole of the al named matters or ingredients well together, by pa them through a fine sieve or machine, as before st And having done this, the preparation or mixture is ready for use, and may be employed in and for the m facture of unfermented bread, and for other purpose the following manner. To make unfermented bread proceed as follows:—To every pound weight of wh flour we add one tea-spoonful of the preparation or mi lastly above described; and having mixed it thoro with the flour in a suitable vessel, we then sift the w through a fine sieve, after which we add a small quanti salt, according to taste, and make up the entire mi with about half a pint of cold water, and bake it in a oven. To make cake which shall resemble pound the same may be effected without the use of eggs, by paring one pound of flour in the manner above st adding thereto about half the quantity of butter comm used, and of currants and sugar, according to taste, mix the whole together with half a pint of cold water, bake it in an oven in the usual way.

And we would here remark that in mixing the s ingredients together, great care should be taken to

the water perfectly cold; and in applying the above mixture to the manufacture of biscuits, and for every other similar purpose, excepting pastry, we use precisely the same proportions of the mixture to the flour as above stated. But for pastry, it will only be necessary to use half the quantity of the mixture to the same quantity of flour.

Having now described the nature of our said invention, and in what manner the same is to be and may be performed, we desire it to be distinctly understood that we do not intend to limit or confine ourselves to the precise proportions of the matters or ingredients hereinbefore set forth and described, but reserve to ourselves the right of making such immaterial variations thereof as experience may suggest, so long as the principle of our said invention be retained; which we hereby declare to consist in, and we claim as of our said invention, the use and application of the matters or ingredients herein stated, and the combining and mixing thereof in the manner hereinbefore particularly described and set forth, as constituting "Improvements in the manufacture of unfermented bread, which improvements are also applicable to other purposes as a substitute for yeast."—In witness, &c.

GEORGE TURNER.
ROBERT HOLLOWAY.

Specification of the Patent granted to FRANCOIS MONFRANT, *of Paris, in the Empire of France, now residing in the Haymarket, in the City of Westminster, Coal Merchant, for Improvements in Lubricating Materials.*—Dated May 2, 1853.—(A communication.)

To all to whom these presents shall come, &c., &c.—The said improvements consist in the employment of all fatty oils (with the exception of coleseed oil), which I disacidify by means of milk, and then cause to blend and intermix with fat or a fatty body, by means of resin or a resinous composition, so as to produce thereby lubricating materials, which may be employed according to their composition, in lieu of the lubricating materials or compounds ordinarily used.

I employ, in preparing the said lubricating materials, a large boiler or heating vessel, heated either by fire, or by

steam, hot air, or otherwise. In this vessel I place the oil to be operated on, and I heat it to such a temperature that the hand can just bear it when immersed. I then add the lard or other solid fatty body (taking care to stir the mixture well with a spatula from this time to the end of the operation), and resin of the ordinary description, or a resinous body, in the proportions necessary to produce the several compositions hereinafter specified, or other like proportions. When these two bodies are perfectly melted, and an intimate commixture has taken place, I add pure fresh milk in the proportion of at least two pints for every 100 kilogrammes (220 lbs. about) of oil, and the greater the impurity of the oil the larger must be the proportion of milk added to it. In the event of milk not being procurable, I employ the same proportion of albumenized water (prepared by adding the white of one egg to a pint of water), or of alkaline water (containing 5 grammes) (3¼ dwts. of crystals of subcarbonate of soda to a pint of water), or even water alone may be used, but milk is in all cases to be preferred. I allow the mixture to be heated to boiling, or until the bubbling produced by the evaporation of the aqueous matters has ceased; and in order to ascertain when the operation has been carried on to a sufficient extent, I place in the heating vessel a slice of new bread; and when this is well browned, or, in other words, when it is fried crusty, the operation is complete. It must be again observed, that it is indispensable that the stirring should be continued throughout the operation; and, in the case of the more solid compounds, even after the boiling is completely finished. When the operation is terminated, as has just been described, the mixture is allowed to repose for several hours, and is then drawn off, before packing it for storage or use, by means of a hand pump or a common syphon. The results of the different operations described are, that by the boiling, all the moisture of the milk and other foreign bodies is entirely dissipated as vapour, and that the acid principles of these substances, combined with the casein of the milk, are rendered insoluble and precipitated, while the oil separated from the deposit which they form contains no acid, and the deposit itself is, in some measure, carbonized, and is easily removed from the vessel. All the products, by being boiled together, are thoroughly incorporated: so that there is no danger of the lard and oil becoming separated, a result to which the resin or resinous

body undoubtedly contributes. If the operation is to be carried on continuously, it will be needful to have tinned iron vessels, into which the clear contents of the boiler can be transferred to cool and settle before being packed away.

The products which I obtain by my modes of operating, are of different characters, and suitable for different lubricating purposes, according to the proportions of the ingredients of which they are composed. The following proportions I have found to produce superior lubricating materials, but these I specify rather as guides than as intending to confine myself to them only.

No. 1.—Compound for the finer carriage work, &c.:—

Resin, 2½ per cent. of the quantity of oil.

Lard, 50 to 75 per cent. of the quantity of oil, according to the degree of solidity required.

No. 2.—Compound for copper, steel, fire-arms, the more delicate kinds of machinery, &c.:—

Resin none; but instead of it, 2 per cent. of common yellow wax.

Lard, 25 to 50 per cent. of the oil employed.

No. 3.—Compound for lubricating oil for machinery:—

Resin, 2½ per cent. of the oil employed.

Lard, 5 per cent.

No. 4.—Compound for the woollen manufacture, &c.:—

Resin, none.

Lard, 3 per cent. of the oil employed; but for this purpose it is indispensable that the lard should be quite fresh.

No. 5.—Compound for paint, oil, &c.:—

Resin, 1 per cent. of the oil employed.

Lard, 2 per cent.

With the addition of the drying material usually employed; say, litharge, 1 per cent.

As before observed, these proportions may be greatly varied. The more lard is used, the harder will be the compound. The weather also affects the proportions to be used, and more lard must be employed in summer than in winter to produce a like effect. The lard may be composed of half hog's lard, and half mutton, or other suet or fatty matter. The lard should be freed from all skin, &c., and cut into small pieces; and it is better also to remove from it any portions of fleshy matter that may be mixed with it; and if the fatty bodies employed, whether lard, mutton suet, beef suet, or other fatty matter, are used in the raw state,

they should be first partly melted before being added to the mixture in the heating vessel, by any of the means ordinarily adopted for such purpose. The products obtained, as before mentioned, can be employed with advantage to replace all the oils employed as lubricators, such as animal oils, lard oil, olive oil, &c. They possess, moreover, the merit of being perfectly unctuous, and of containing no kind of acid; they do not act prejudicially on metals, nor form any residuum through friction; they neither turn rancid from age, nor do they harden from contact with the air; and, lastly, their component parts do not separate from each other, but continue always in intimate commixture.

And having now described the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is,—

The manufacture of lubricating materials by the employment of all fatty oils (with the exception of coleseed oil), disacidified by means of milk, and caused to blend and intermix with fat or a fatty body, by means of resin or a resinous composition, as hereinbefore described.—In witness, &c.

FRANCOIS MONFRANT.

Specification of the Patent granted to EDWARD ONSLOW ASTON *and* GEORGE GERMAINE, *both of Mill Wall, in the County of Middlesex, Master Mariners, for Improvements in Compositions for Coating Wood, Metal, and other Materials exposed to the action of Sea Water or the Weather.*—Dated April 23, 1853.

To all to whom these presents shall come, &c., &c.—Our invention refers to mineral compositions, prepared principally from sulphur and salts or oxides of copper, which are to be applied while in a hot liquid state to metal, wood, stone, cement, and other materials; being used for wood ships, in lieu of coppering, and for iron ships instead of the usual anticorrosive paints and other ingredients employed for coating the same; and may likewise be used as a preventive of the action of the weather or sea-water generally, by coating the surfaces of the exposed materials therewith.

And for the better understanding of our said invention, we will now proceed to describe the details of our process, and our mode of using our mineral preparations.

We melt together, and thus combine in variable proportions, sulphur, naphtha, and creosote; adding thereto verdigris or acetate of copper. Sometimes we substitute for verdigris, copper pyrites, artificial sulphurets of copper, blue vitriol or sulphate of copper, and other combinations of copper with acids or oxygen, either singly or mingled, being first properly ground. The sulphur, naphtha, creosote, and sulphuret, or salt or salts of copper, singly or combined, are to be heated together and well stirred, after which the composition resulting therefrom may be poured out into suitable moulds, and when cold broken up and packed in a dry hard state, ready to be remelted when wanted for use.

One of the various preparations that may be thus compounded is made by fusing in an iron pan, or any convenient vessel, three parts by weight of sulphur, and adding one part of naphtha heated in a separate pan. When these materials are thoroughly incorporated, one pound of acetate of copper or verdigris is to be added to every eight pounds of the composition, and well stirred into it; after which it may be run into moulds, cooled, and stored for use. Or, the sulphur being melted, the verdigris may be added, then the naphtha, and afterwards the creosote, at a boiling heat, to secure the amalgamation of the materials. The same process will apply to the adding of pyrites, they being first well pulverized, and to the salts and oxides of copper generally; all which may be used in variable proportions according to the quality required.

To coat iron with any of our improved mineral compositions, we recommend the surface of the iron to be first well cleaned by scraping, and then rubbing it over with a stiff brush repeatedly dipped in hot naphtha. When a sufficient surface has been thus prepared, a pot of the hot composition is to be provided and spread over the prepared iron, as customary in using pitch. When the sides and bottom of an iron vessel have thus to be prepared, the iron must be first freed from all moisture by common rubbing and firing, or in some cases simply by sanding or dusting it over with any dry ashy absorbent powder; the iron will then be ready for cleaning with the hot naphtha before laying on the mineral composition.

To coat wood, and particularly wood ships' bottoms, the surface should be scraped clean, then coated with a boiling compound of naphtha and creosote, preparatory to applying the mineral composition, the surface of which may be afterwards smoothed with suitable hot irons.

Our mineral compounds may be applied to dry surfaces, with or without the first application of hot naphtha, particularly when used for buoys, piles, and all common outdoor work; and for roofs to guard them against either moisture or the attacks of insects.

For ships' bottoms, and all exposed iron or wood marine work, these compositions will be found to preserve them from the sea worm, and the adhesion of animal and vegetable products common under such circumstances, in consequence of the well-known action of the mineral poisons. We, therefore, do not restrict ourselves to any particular proportions of the several ingredients.

And we do declare that what we especially claim as our invention is, namely, the use of sulphur combined with any oxides, sulphurets, or salts of copper for the purposes herein described.—In witness, &c.

EDWARD ONSLOW ASTON.
GEORGE GERMAINE.

Specification of the Patent granted to JOHN BETHELL, *of No. 8, Parliament-street, Westminster, Gentleman, for Improvements in the Manufacture of Flax.*—Dated April 14, 1853.

To all to whom these presents shall come, &c., &c.—My improvements in the manufacture of flax consist in an easier mode of obtaining the flax fibre from the straw than has hitherto been done by the old process of retting. By the process of retting, all the gummy, mucilaginous, and pithy substances in the flax straw, which cover and bind the flax fibres together in the stalk, are dissolved out in the water by the aid of the fermentation which takes place during the process, but there are many objections to this retting process, which I need not now describe.

My invention consists of dissolving out these gummy, mucilaginous, and pithy substances in the flax straw with-

out fermentation, and by a process very similar to the mashing process used by brewers for extracting beer from malt, and which I carry out as follows:—

I place the flax straw in a vat or vessel like a brewer's mash tub, which has in it a coil of steam pipe, and I cover the straw with hot water not exceeding the temperature of 105 degrees of Fahrenheit, then cover over the vat, and allow the straw to steep for some time (about two hours), during which time the straw is agitated or stirred about as the brewers stir about the malt in their mash tubs, and the temperature is kept up to 105 degrees, or rather more; after some time (about two hours), the temperature is increased, either by passing steam through the coil of pipe, or by adding water of a higher temperature, so as to increase the heat of the water gradually up to about 120 degrees, and then gradually up to 200 degrees of heat of Fahrenheit. After some hours (which vary from six to ten hours, according to the kind of the straw operated upon), the liquor is drawn off, and a second charge of fresh water, heated to about 120 degrees, is added, and the steeping continued for some time longer, the temperature being gradually increased up to 190 degrees, as before; and if, on drawing off this second charge of liquor, it is found that the flax is not sufficiently prepared, more charges of hot water are added, until the whole of the gummy, mucilaginous, and pithy matters are dissolved out of the straw. The flax is then taken out of the mash tub, dried, and scutched in the usual way.

Instead of using one mash tub or vat, several vats may be used, one above another, each of which vats may be filled with flax, and the liquor from the first and top vat run into the second, and so on, until all the gummy, mucilaginous, and pithy matters are extracted, and a very strong solution obtained.

At the commencement of the process the straw must be kept in water, not exceeding 105 degrees of Fahrenheit, for about two hours, whereby the albuminous matter will be dissolved out. If the water was hotter at first, the albuminous matter would be liable to coagulate, and would not afterwards so easily dissolve; but after the albuminous matter is dissolved out, the temperature is to be gradually increased up to 190 degrees, whereby the pith in the straw will be dissolved, and the flax fibres liberated.

I sometimes add to the water before it is used, a little soda, or little liquor ammonia, or other alkali, to make the

water feel soft, which enables it to dissolve the mucilag matter in the flax straw more easily.

The solution or extract thus obtained from the straw be found to be very valuable for mixing with other fo feed cattle with.

I claim as my invention the using the process described (which is similar to the mashing process use brewers to extract beer from malt), instead of the known retting process, for the purpose of dissolving without fermentation, all the gummy, mucilaginous pithy matters in the flax straw, and thus preparing the usual and well-known process of scutching. witness, &c.

JOHN BETHE

Specification of a Patent granted to ADOLPHE M ALEXANDRE IGLESIA, *of Russell-place, Fitzroy-s in the County of Middlesex, Mechanic, for Improv in Producing Ornamental Glass Surfaces.*—Dated 9, 1853.

To all to whom these presents shall come, &c., My invention of improvements in producing orna glass surfaces consists,

First, in the production of ornamental surfaces in tion of marble, granite, or any substance capable similar polish, by applying, to the under surface of or pieces of glass, paper, or any other suitable material, on which may be printed, lithographed, dra coloured, by any of the well-known processes, a device, figure, or pattern in imitation of such m granite, or other substance.

My invention consists, secondly, in ornamentin under surfaces of glass by applying thereto paper other pliable material, on which may be printed, graphed, drawn, coloured, or otherwise produced other suitable process, a design or device which shal the effect of designs painted upon such surface, or of or other ornamental work.

The third part of the invention relates to a met consolidating or strengthening the pieces of glas

ornamented, so as to give them the strength of marble or stone.

The process which I employ for the first and second of the purposes aforesaid is as follows:—I dissolve in a vessel of pure water, by the employment of a water bath at a gentle heat, gelatine or common glue, or any other gelatinous substance, all of which I hereinafter call "glue." In selecting the material to be employed for this purpose I prefer such as is of a white colour, as far as it can be conveniently obtained. I do not limit myself to any particular strength of solution, but that which I prefer usually to employ is of the strength ordinarily used for the purposes of carpentry.

When the glue or gelatinous substance is entirely melted, it must be strained through a sieve, so as to remove all impurities; after which it must be warmed to about 80 degrees Fahrenheit, when it will be fit for use. I then take the piece of glass to which the paper or other substance having the design thereon (all of which I hereinafter call the "paper") is to be applied, and, after washing the glass well with warm water, I lay the paper upon it, with the decorated surface uppermost, and pass the solution all over it by means of a sponge; I then remove the paper from the glass, and wet the glass well with the solution, after which I replace the paper upon the glass, with the moistened surface undermost, and pass the solution again over it with the sponge, taking care to remove any folds or creases which may show themselves. I then turn the piece of glass over, so as to place the paper underneath it, and after raising the glass with the left hand, I pass warm water over the surface of the glass with a sponge, until all the glue is completely melted. I then, by means of a piece of steel with the edge rounded, press out the glue from between the paper and the glass; and, lastly, I turn the glass so as to place the paper uppermost, and repeat the same operation until the superfluous glue is removed; after which I clean the back of the paper with a sponge moistened with warm water, and then I leave it to dry. The temperature of the water employed in this operation should not exceed 80 degrees to 100 degrees Fahrenheit.

I apply the process above described to the production of patterns made of different pieces of papers of various colours by the following method:—I glue the separate pieces, arranged so as to form the desired pattern, design,

or device, upon cloth; the design thus composed may, when dry, be fixed on the glass in the manner described above; then, upon moistening the back of the cloth, and carefully removing it, the pieces forming the design will remain and adhere to the glass.

In order to form such a pattern I also sometimes apply the paper which is to form the foundation of the pattern to the glass in one piece, and afterwards cut out such parts as require to be removed to allow of the introduction of the design, and remove them by means of a little warm water and a brush and any blunt instrument, and fill up the vacant spaces with the paper, which must be attached by the methods before described.

The glass employed may be of any kind, care being taken to select such pieces as are not much curved and are not very brittle.

The third part of the invention, namely, the strengthening of the glass plates prepared in the manner above set forth, is effected in the following manner:—When the paper attached to the glass is quite dry, I apply to the back of it a resinous composition, which I hereinafter call "the mastic," and is made of rosin, plaster of Paris, grease, dry sawdust, cotton flock, or, in lieu of the last two substances, of sand. The mixture which I prefer, consists of four pounds of rosin, four pounds of plaster of Paris, half a pound of grease, and three-quarters of a pound of sawdust. If it is desired to make the composition very hard, the quantity of grease may be diminished, or it may even be omitted altogether. All the substances may be put on together and melted over a slow fire, and the whole stirred up with a piece of iron until they are well mixed together.

Before applying the mastic I have found it useful to cover the back of the paper with a mixture of glue and whitening, or of glue and plaster of Paris, which should be allowed to get quite dry. The use of this covering is to protect the glass from being cracked by the heat of the mastic, but, if care be taken in the application of the latter, it may be dispensed with. To prevent the danger of the front of the glass being scratched, I cover it over with a similar mixture. The mastic is applied at a temperature just sufficient to keep it melted. In applying the mastic I lay the glass upon an even surface of wood, and if the surface of the glass is not quite flat I place upon the edge of it weights of about six or eight pounds each, at a distance

of two or three inches from each other, so as to flatten it; I then lay on the mastic evenly with a trowel upon the paper until it is one-eighth of an inch thick, commencing from the outside, and changing the position of the weights as I proceed to a part where the mastic is dry enough to support them, and applying it gradually, so as not to heat the glass suddenly. When the mastic is quite dry, I take slips of slate, about three inches broad and a quarter of an inch thick, and of a length regulated by the size of the glass, but not exceeding two feet, through different parts of which must be previously pierced a number of holes by means of any common borer. These holes should be larger at the side which is intended to be nearest the glass than at the bottom. The bottom surface of the slate should be slightly warmed, and then a portion of fresh mastic may be applied to that part of the previously covered surface to which I desire to apply the slate; and I press the slate down upon it, so as to force the mastic up through the holes. When, by this process, one piece of slate is attached to the mastic, I lay another alongside of it, taking care to fill up the intervals between the pieces of slate and the holes in these pieces with the mastic until I have entirely covered the back of the glass and paper with mastic and slate. So soon as the mastic is cold, the glass will remain straight and solid, and the decorated surface will be perfectly preserved from injury.

If a further thickness be required, it may be obtained by a repetition of the same process.

In the process above described, I do not limit myself to the use of slate as a backing for the ornamental glass surfaces, but I also sometimes propose to employ brick, stone, iron, or other metals in solid sheets or bars, or wood or other substances in frames or solid pieces, according to the nature of the work required. Nor do I limit myself to any particular size or thickness of the material employed, these being capable of variation according to the circumstances of each case, and the degree of solidity necessary to be given to the glass. In cases where lightness is required, and where the glass is not exposed to violent blows, I even dispense with any backing except the mastic, which I always employ.

In applying my invention to the coating of bricks or stones with ornamented glass surfaces, I do not carry the holes by which the brick or stone is attached to the mastic

through the substance thereof, as in the case of slate, but only cut them a little way into it.

The blocks or slabs, prepared as aforesaid, may be fixed in a wall or used as a flooring with ordinary cement, in the same way as ordinary blocks or slabs of marble, requiring only similar precautions to those commonly used by workers in marble to preserve them from scratches; and pieces of wood, iron, or any other solid substance may be let into the mastic, so as to give facilities for attaching the blocks or slabs.

Having now described my invention, and the best means with which I am at present acquainted for carrying the same into operation, I claim, in conclusion, ornamenting glass surfaces, as above described, with various devices, designs, or imitations of natural objects by means of paper or other suitable flexible material, on which may be printed, lithographed, drawn, or coloured, the desired device, design, pattern, or imitation. I also claim the methods above described of strengthening or consolidating such ornamented surfaces, and rendering them applicable to the various purposes for which they may be employed.—In witness, &c.

ADOLPHE MARIUS ALEXANDRE IGLESIA.

Specification of the Patent granted to WILLIAM WEATHERLEY *and* WILLIAM JORDAN, *of Chartham Mills, in the County of Kent, Engineers, for Improvements in the Stuffing-Boxes of Piston-Rods.*—Dated May 26, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of a combination of several metal split or divided rings, with angular or wedge-form sections. Two forms of rings are used; one form with its widest part inwards and inclining outwards, the other form of rings have their widest surfaces outwards and inclining inwards. These are placed in alternate succession around the piston-rod, and within a stuffing-box, the cover of which is kept down by screws and nuts, or with springs.

Having thus stated the nature of our said invention, we will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a vertical section of a stuffing-box and piston-rod, the stuffing or packing consisting of rings *a*, *a*, and *b*, *b*, arranged according to our invention.

Fig. 2, shows the two forms of rings, *a* and *b*, of which the packing is composed. The rings we prefer to be of metal,—tin; but we do not confine ourselves to the use of that metal.

Fig. 3, shows a vertical section of another stuffing-box; and Fig. 4, shows the rings separately. The rings, *a* and *b*, shown in these figures, somewhat differ in form to those shown in figs. 1 and 2, but they act on the same principle. In both cases the wedge form of the rings, *a*, *a*, when passed on by the cover, *d*, of the stuffing-box, by reason of their widest parts being outward, tends to force the other wedge-formed rings inwards, so as to cause them to come close to and embrace the piston-rod, *c*, and this it is which constitutes the peculiarity of our invention.

Having thus described the nature of our invention, and the manner in which the same is performed, we would have it understood that what we claim is, the mode herein described of constructing stuffing-boxes by combining a series of split or divided rings, *a*, *b*, as shown and explained. —In witness, &c.

WILLIAM WEATHERLEY.
WILLIAM JORDAN.

Specification of the Patent granted to JAMES SHANKS, ***of St. Helen's, in the County of Lancaster, Manufacturing Chemist, for Improvements in the Manufacture of Alkali from Common Salt.***—Dated June 18, 1853.

To all to whom these presents shall come, &c., &c.—In the manufacture of alkali from common salt (as the manufacture is usually conducted) common salt is decomposed by sulphuric acid, so as to produce sulphate of soda, and this sulphate of soda is decomposed by fluxing it in mixture with lime and small coal, thus producing "black ash" or "rough soda." This "black ash" or "rough

soda" is then lixiviated with water, to dissolve the soluble compounds of soda, which are used for the manufacture of alkali, and there remains an undissolved residuum, which is known as "alkali waste," and has hitherto been thrown away as a worthless product. This "alkali waste" contains sulphur combined with lime, or with calcium, the metallic base of lime.

The object of my improvements is to apply sulphur, contained in such "alkali waste," to the decomposition of common salt, and thereby to produce sulphate of soda, being applied to the manufacture of alkali; by fluxing it with lime and coal, occasions a further production of "alkali waste," which can be also applied in the same manner to the decomposition of a further quantity of common salt, and the production of a further quantity of sulphate of soda, suitable for the production of a quantity of alkali.

To effect the object of my improvements I mix "alkali waste" with common salt, and add thereto small coal, and such a quantity of clay (mixed with sufficient water) as will give cohesiveness to the mass, and thereby provide for its being formed into balls or masses, which I prefer to make about the size of a hen's egg, and I introduce such balls (after being well dried) into a kiln of a similar construction to the kilns usually employed by alkali manufacturers for burning pyrites, for the production of sulphuric acid; I cause such kiln to be heated in the first instance by the combustion of fuel therein, and I introduce the first portion of balls on such burning fuel, when the balls become ignited; and by successive additions I cause the kiln to become nearly filled with balls, some or all of which are in a state of ignition; I withdraw at intervals from the lower part of such kiln the product which has undergone ignition, and I find that common salt previously contained in such balls has been converted into sulphate of soda, and calcium previously combined with sulphur in the "alkali waste" has become converted into lime.

I supply additional quantities of balls to the kiln or kilns which I employ, so as to have a continued supply of balls which have undergone ignition, to be withdrawn from the lower part of such kiln or kilns.

I have hereinbefore stated, that, in effecting the objects of my invention I mix "alkali waste" and common salt with small coal, and form the mixture into balls or masses, as

hereinbefore described. My object in adding small coal is, to communicate heat by its combustion to the mixture of "alkali waste" and common salt, and thereby to determine the reaction of these two compounds upon each other, (in the pressure of atmospheric air,) which is requisite for the production of sulphate of soda. I prefer also to assist the said reaction of heat derived from the combustion of fuel not forming part of the composition of such balls. For this purpose I provide a furnace, so connected with each of the kilns in which I am causing the said balls to undergo ignition, that flame and heated air (proceeding from fuel undergoing combustion on the grate of such furnace) can be conducted into the lower part of such kiln, and caused to percolate through the mass of balls contained therein. I prefer to burn such a quantity of fuel on the grate of such furnace as I find to be sufficient to keep the balls, through which the products of combustion are caused to percolate, at a full red heat, but taking care that such heat shall not be sufficient to cause the balls to become fluxed.

I separate sulphate of soda from such ignited balls by lixiviating the same with water. I cause the solution of sulphate of soda which I thus obtain to be evaporated, so as to produce dry sulphate of soda, suitable to be used for the manufacture of alkali; or in place of separating sulphate of soda from the said balls by lixiviation, I add to the mixture of sulphate of soda and lime, obtained by the ignition of such balls, an additional quantity of sulphate of soda, lime, and small coal, in suitable proportions, and flux the mixture so as to make "black ash" or rough soda.

The arrangement of kilns I have hereinbefore referred to, as being commonly used for burning pyrites in the manufacture of sulphuric acid, provides for the access of atmospheric air to the pyrites undergoing combustion. In the same manner it is essential that atmospheric air should have access to the balls containing "alkali waste" and common salt undergoing ignition in the kilns, employed for effecting the objects of my improvements.

I prefer also to introduce a supply of steam, together with the atmospheric air, to assist the decomposition of common salt in the balls.

"Alkali waste" (in the dry state) usually contains about

sixteen per cent. of sulphur, and assuming this to be its composition, I add 100 parts of such "alkali waste," sixty parts common salt, 100 parts of small coal, and sufficient of clay and water to give the requisite cohesiveness to the mixture; I vary the proportion of common salt employed, relatively to the "alkali waste," according to the sulphur contained in such waste, preferring to use sixty parts of common salt for each sixteen parts of sulphur present in the "alkali waste."

I have hereinbefore stated that pyrites is used by alkali manufacturers for the production of sulphuric acid; one of the results of such use of pyrites is the production of an oxide of iron, commonly called "burned pyrites." When I have a convenient supply of such material I prefer to add some of this to the mixture of "alkali waste," common salt, and other materials hereinbefore referred to, and I prefer to add about twenty-five parts of "burned pyrites" for each 100 parts of "alkali waste" employed.

I have hereinbefore described and ascertained certain means by which I prefer to carry into effect my invention of producing sulphate of soda by the use of common salt and "alkali waste," which "alkali waste" is one of the results of the manufacture of alkali from common salt, and has heretofore been considered as a worthless product, and which sulphate of soda I employ for the production of alkali; but I do not confine myself to the employment of the exact means herein described, nor to the precise proportions of materials herein indicated, as these may be varied to some extent without deviating from the nature of my invention.

I claim as my invention the production of sulphate of soda (for the purpose of using this for the production of alkali) by exposing a mixture of common salt and "alkali waste," together with small coal (made into balls or masses), to the action of atmospheric air, and heat in kilns by means of such arrangements as may provide for the proper application of heat and of atmospheric air to such balls or masses.—In witness, &c.

JAMES SHANKS.

Specification of the Patent granted to FREDERICK AYCKBOURN, *of No. 99, Guildford-street, Russell-square, in the County of Middlesex, Patent Folding-boat Manufacturer, for Improvements in the Manufacture of Waterproof Fabrics.*—Dated June 22, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists in rendering waterproof woven, felted, looped, and other similar fabrics and paper, and also leather, by coating, covering, or preparing the same with a solution or preparation of india-rubber, or with chouca, marine glue, or other suitable cement, and then facing the surface of such coating, covering, or preparation with gutta percha, in the form of a paste, or in solution, or in a plastic state.

And having thus set forth the nature of my said invention, I will now proceed to describe the manner in which it is to be performed, according to the process or processes which I prefer, and by which I consider it may be best carried into effect.

I take a piece of woven, felted, or looped cloth, or other fabric, or a piece of paper, or leather, and coat or cover the same, in the manner described in the specification of a patent granted to me, and bearing date the 22d day of December, 1852, or by any ordinary well-known processes, with india-rubber solution or with chouca, marine glue, or other cement, in suitable quantity or proportion, according to the nature of the fabric employed, and in one or more coats, or separate applications, according to the nature and purpose of the material to be proofed. Between each coat or application I drive off by heat, or allow to evaporate by exposure to the air, the volatile spirit contained in the solution or cement, in the ordinary manner; and I then place the surface of the coating, covering, or preparation, so firstly formed or applied (in one or more layers), by or with the gutta percha (in the form of a paste or solution, or in a plastic state), and heated to the requisite temperature for freely working the same (such paste or solution being also applied in one or more layers) by the ordinary process or processes, or any of them, as I have already described for the said firstly formed or applied coating, covering, or preparation; and thus I form or apply

a second coating, covering, or preparation, in one or layers, outside of and upon the surface of the first.

Both sides of the fabric or material may be similarly treated, in which case I complete the process or prepare on one side first, and afterwards those on the other.

I wish it to be understood that I herein lay no claim to the application of gutta percha in sheets to or upon surfaces prepared as herein described, as such application is already the subject of the letters patent granted me, and are hereinbefore referred to.—In witness, &c.

FREDERICK AYCKBOURN.

PATENTS SEALED TO JANUARY 25, 1

1910. ARCHIBALD DOUGLASS, of Norwich, Silk Manufacturer. Improved machinery for stitching, back-stitching, and running. Dated August 15, 1853. Sealed December 19, 1853.

2052. JAMES DAVIS, of the Low Furness Iron Works, nes stone, in the county of Lancaster, Iron Master, and ROBERT I of the same place, Engineer and Fitter, for An improved e be worked by steam, air, or water.—Dated September 6, 1853. December 19, 1853.

2192. PETER ROTHWELL ARROWSMITH, of Bolton-le-Moor county of Lancaster, and JAMES NEWHOUSE, of the same plac looker, for Certain improvements in machines for spinning a ling.—Dated September 22, 1853. Sealed December 19, 185

2263. HENRY JACOB JORDAN, of Berners-street, in the c Middlesex, Gentleman, for An improved medicine for the venereal affections, which he denominates the "Treisemar." October 4, 1853. Sealed December 19, 1853.—(A communic

2331. JAMES HALL NALDER, of Alvescott, in the county of Farmer, and JOHN THOMAS KNAPP, of Clanfield, in the same Machinist, for Improvements in winnowing and dressing Dated October 11, 1853. Sealed December 19, 1853.

2350. CHARLES SCOTT JACKSON, of Cannon-street, City, provements in preserving timber and other vegetable matters. October 12, 1853. Sealed December 19, 1853.

2429. JOHN HENRY JOHNSON, of Lincoln's Inn-fields, Ge for Improvements in the treatment or manufacture of gutta and in the application thereof.—Dated October 21, 1853. December 19, 1853.—(A communication.)

2440. FREDERICK ALBERT GATTY, of Accrington, in th of Lancaster, Manufacturing Chemist, for Improvements in or producing colours on textile fabrics.—Dated October 2 Sealed December 19, 1853.

2469. EDWARD AUSTEN, of Pembroke Cottages, Caledon in the county of Middlesex, Master Mariner, for Improve surveying and raising sunken vessels, and in apparatus used

and in lifting vessels over bars and other obstructions.—Dated October 26, 1853. Sealed December 19, 1853.

2471. RICHARD HEYWORTH, of Cross Hall, near Chorley, in the county of Lancaster, Manufacturer, and THOMAS BATTERSBY, of Cross Hall aforesaid, Overlooker, for Certain improvements in looms for weaving.—Dated October 26, 1853. Sealed December 19, 1853.

2506. WILLIAM BETTS, of Wharf-road, City-road, in the county of Middlesex, Gentleman, for Certain improvements in machinery for manufacturing metallic capsules.—Dated October 29, 1853. Sealed December 19, 1853.

2515. ANTHONY PARK COUBROUGH, of Blanefield, in the county of Stirling, Calico Printer, for Improvements in printing textile fabrics and other surfaces.—Dated October 31, 1853. Sealed December 19, 1853.

2538. EDWARD WARD, of Potton, in the county of Bedford, Coach Builder, for An improvement in carriage axles.—Dated November 2, 1853. Sealed December 19, 1853.

1199. CHARLES CRICKMAY, of Handsworth, in the county of Stafford, Gun Manufacturer, for Improvements in the construction of fire-arms.—Dated June 20, 1853. Sealed December 20, 1853.

1500. JOHN PAUL, of Manchester, Paper Stainer, for Colouring paper on the surface.—Dated June 20, 1853. Sealed December 20, 1853.

1505. JOHN WILLIAM PERKINS, of Narrow-street, Limehouse, in the county of Middlesex, Analytical Chemist, for Improvements in the manufacture of artificial manure.—Dated June 20, 1853. Sealed December 20, 1853.

1510. ROBERT GALLOWAY, of Cartmell, in the county of Lancaster, for Improvements in the manufacture and refining of sugar.—Dated June 20, 1853. Sealed December 20, 1853.

1512. JOSEPH SKERTCHLEY, of Kingsland, Middlesex, Engineer, for Improvements in the application of baths to articles used for resting the human body.—Dated June 23, 1853. Sealed December 20, 1853.

1514. HENRY BLATIN, of Paris, Gentleman, for Improvements in buckles.—Dated June 20, 1853. Sealed December 20, 1853.

1521. JOHN HENRY NOONE, of Salisbury-street, Portman-market, in the county of Middlesex, Journeyman Coach Builder, for An improved mode of stopping railway trains and preventing railway accidents.—Dated June 22, 1853. Sealed December 21, 1853.

1527. NOEL NATALIS DU CHASTAINGT, of Paris, Chemist, for An improvement in bread making.—Dated June 23, 1853. Sealed December 21, 1853.

1536. THOMAS RESTELL, of the Strand, Chronometer Maker, for Improvements in walking sticks, umbrellas, applicable also to parasols.—Dated July 9, 1853. Sealed December 21, 1853.

1781. WILLIAM WOODS COOK, of Bolton, Muslin Manufacturer, for Improvements in the manufacture of woven fabrics, and in the apparatus employed therein.—Dated July 30, 1853. Sealed December 21, 1853.

2039. GAGE STICKNEY, of Hanover-street, Pimlico, in the county of Middlesex, Mechanical Engineer, for An improved construction of blower.—Dated September 3, 1853. Sealed December 21, 1853.—(A communication.)

2040. GAGE STICKNEY, of Hanover-street, Pimlico, in the county of Middlesex, Mechanical Engineer, for Improved machinery for forging metals.—Dated September 3, 1853. Sealed December 21, 1853.—(A communication.)

2392. CAPPER PASS, of Bedminster, Metal Refiner, for Improvements in the manufacture and refining of copper.—Dated October 17, 1853. Sealed December 21, 1853.

2438. JAMES GREENBANK and SAMUEL PILKINGTON, of Withnell, in the county of Lancaster, Overlookers, for Improvements in machinery for spinning cotton and other fibrous substances.—Dated October 21, 1853. Sealed December 21, 1853.

1544. JOHN LYLE, of Glasgow, Manufacturer, for Improvements in the manufacture of figured or ornamental fabrics.—Dated June 24, 1853. Sealed December 23, 1853.

1546. LEON VALLS, of Paris, Merchant, for Improvements in the production of printing surfaces.—Dated June 24, 1853. Sealed December 23, 1853.—(A communication.)

1547. DANIEL ILLINGWORTH, ALFRED ILLINGWORTH, and HENRY ILLINGWORTH, of Bradford, Worsted Spinners, for Improvements in machinery or apparatus for combing wool, cotton, flax, silk, and other fibrous substances.—Dated June 25, 1853. Sealed December 23, 1853.

1669. WILLIAM NEEDHAM, of Smallberry-green, in the county of Middlesex, Manufacturer, and JAMES KITE, of Princes-street, Lambeth, Engineer, for Improvements in machinery for expressing liquid or moisture from substances.—Dated July 14, 1853. Sealed December 23, 1853.

1676. ROBERT SMITH BARTLEET, of Redditch, for Improvements in the manufacture of sewing-machine needles.—Dated July 14, 1853. Sealed December 23, 1853.

1765. JOHN KNOWLES, of Manchester, Manager, for Certain improvements in looms for weaving.—Dated July 27, 1853. Sealed December 23, 1853.

1857. GEORGE PARSONS, of West Lambrook, in the county of Somerset, Engineer, for Improvements in steam-engines and boilers.—Dated August 10, 1853. Sealed December 23, 1853.

1896. JOHN CLEGG BOOND, of Manchester, Warehouseman, for Certain improvements in Jacquard apparatus.—Dated August 13, 1853. Sealed December 23, 1853.

2216. WILLIAM PRIOR SHARP, of Manchester, Engineer, JOHN HILL, of the same place, Manager, and WILLIAM MARTIN, of the same place, Manager, for Improvements in machinery for spinning and doubling cotton, and other fibrous substances.—Dated September 27, 1853. Sealed December 23, 1853.

2508. JOSEPH HALEY, of Manchester, Engineer, for Improvements in machinery or apparatus for cutting, boring, and shaping metals, and other substances.—Dated October 31, 1853. Sealed December 23, 1853.

1548. ANTOINE ANDRAUD, of Paris, Civil Engineer, for Certain Improvements in railways and locomotives running thereon, which improvements facilitate the ascension of steep inclines.—Dated June 25, 1853. Sealed December 24, 1853.

1559. CARLO MINASI, of Camden-town, in the county of Middle-

ner, Professor of Music, for Improvements in concertinas.—Dated June 28, 1853. Sealed December 28, 1853.

1561. Auguste Edouard Loradoux Bellford, of Castle-street, Holborn, in the city of London, for Improvements in steam-boilers.—Dated June 28, 1853. Sealed December 28, 1853.—(A communication.)

1562. Auguste Edouard Loradoux Bellford, of Castle-street, Holborn, in the city of London, for Improvements in magneto-electric machines.—Dated June 28, 1853. Sealed December 28, 1853.—(A communication.)

1564. Thomas Edward Irons, of Market-gate, in Arbroath, North Britain, Last Maker, for Improvements in the manufacture of lasts and in machinery connected therewith, parts of which machinery are also applicable to other like purposes of eccentric turning.—Dated June 29, 1853. Sealed December 28, 1853.

1581. William Charles Spooner, of Eling House, near Southampton, Manufacturer of Chemical Manures, for Improvements in drills for agricultural purposes.—Dated June 30, 1853. Sealed December 28, 1853.

1582. William Tasker, of the Waterloo Works, Andover, in the county of Hants, for Improvements in drills for agricultural purposes.—Dated June 30, 1853. Sealed December 28, 1853.

1598. Henry Meyer, of Manchester, Engineer, for Certain improvements in looms for weaving.—Dated July 5, 1853. Sealed December 28, 1853.

1601. John Fall, of Chorlton-upon-Medlock, Manchester, Gentleman, for Improvements in the treatment of certain oils.—Dated July 5, 1853. Sealed December 28, 1853.

1621. Alexander Angus Croll, of Howrah House, East India-road, one of the Sheriffs of London and Middlesex, for Improvements in apparatus used in the manufacture of gas.—Dated July 7, 1853. Sealed December 28, 1853.

1625. Thomas Moss, of Gainford-street, Islington, in the county of Middlesex, for Improvements in printing bank notes, checks, bills of exchange, and other documents requiring like security against being copied.—Dated August 4, 1853. Sealed December 28, 1853.

1699. Chandos Wren Hoskyns, of Wroxhall, in the county of Warwick, Esquire, for Improvements in the application of steam to cultivation.—Dated August 13, 1853. Sealed December 28, 1853.

1967. Benjamin Hornbuckle Hine and Anthony John Mundella, of Nottingham, Manufacturers, and Thomas Thompson, also of Nottingham, Mechanic, for Improvements in machinery for the manufacture of textile and looped fabrics.—Dated August 24, 1853. Sealed December 28, 1853.

2206. Charles Edward Austin, of Rookwoods, Stroud, in the county of Gloucester, Civil Engineer, for An improved reaping, gathering, and binding machine.—Dated September 24, 1853. Sealed December 28, 1853.

2337. Bernard Couvan, of Fenchurch-street, in the city of London, for Improvements in giving signals on railways.—Dated October 11, 1853. Sealed December 28, 1853.

2351. Richard Jones and Charles John Jones, both of Ipswich, in the county of Suffolk, Engineers, for Improvements in fire-arms.—Dated October 12, 1853. Sealed December 28, 1853.

2358. JOHN THOMAS WAY, of Holles-street, Cavendish-square, in the county of Middlesex, Professor of Chemistry, for Improvements in making and refining sugar, and in treating saccharine fluids.—Dated October 13, 1853. Sealed December 28, 1853.

2433. JAMES WARBURTON, of Addingham, in the county of York, Spinner, for Improvements in preparing rape-seed oil.—Dated October 21, 1853. Sealed December 28, 1853.—(A communication.)

2442. JOHN BAILY, of Mount-street, Grosvenor-square, London, for An invention for the cure of the roup and other diseases in fowls and poultry.—Dated October 22, 1853. Sealed December 28, 1853.

2455. THOMAS SUMMERFIELD, of Birmingham, Glass Manufacturer, for Improvements in the construction and manufacture of windows.—Dated October 25, 1853. Sealed December 28, 1853.

2460. ALFRED CURTIS, of Sarratt Mills, in the county of Herts, Paper Manufacturer, and BRYAN DONKIN, of Bermondsey, in the county of Surrey, Engineer, for Improvements in machinery for cutting rags, rope, fibrous and other substances.—Dated October 25, 1853. Sealed December 28, 1853.

2466. CHARLES GOODYEAR, of Avenue-road, St. John's-wood, in the county of Middlesex, for Improvements in the manufacture of boots and shoes.—Dated October 25, 1853. Sealed December 28, 1853.

2475. DOWNES EDWARDS, of Ravenscliffe, Douglas, Isle of Man, for Improvements in signal apparatus for railways.—Dated October 26, 1853. Sealed December 28, 1853.

2476. PATRICK BENIGNUS O'NEILL, of Paris, for Improvements in screw wrenches.—Dated October 26, 1853. Sealed December 28, 1853.—(A communication.)

2496. ARISTIDE MICHEL SERVAN, of Philpot-lane, in the city of London, for Improvements in treating phormium tenax, flax, and other vegetable fibrous matters.—Dated October 28, 1853. Sealed December 28, 1853.

2497. JOHN JOHNSON, of Over Darwen, in the county of Lancaster, Mechanic, for Improvements in looms for weaving terry and other similar fabrics.—Dated October 28, 1853. Sealed December 28, 1853.

2526. JOHN WHITEHEAD and THOMAS WHITEHEAD, of Leeds, Machine and Tool Makers, for Certain improvements in cutting tools; and in the working of iron, brass, and other metals, and wood and other material.—Dated November 1, 1853. Sealed December 28, 1853.

2530. JOSEPH BAUER, Captain to His Majesty the Emperor of Austria's 57th Regiment of Foot, a native of Vienna, for Cultivating and digging the soil by means of a steam digging and harrowing machine.—Dated November 1, 1853. Sealed December 28, 1853.

2544. JAMES HOWARD, of Bedford, Ironfounder, for Improvements in horse-rakes and harrows.—Dated November 2, 1853. Sealed December 28, 1853.

2545. RICHARD EDWARD HODGES, of Southampton-row, Russell-square, in the county of Middlesex, for An improvement in fastening the ends of springs made of india-rubber.—Dated November 2, 1853. Sealed December 28, 1853.

2546. CHARLES ILES, of Peel Works, Birmingham, for Improvements in metal bedsteads.—Dated November 2, 1853. Sealed December 28, 1853.

2551. THOMAS IRVING, of Dalton, in the county of York, for Improvements in preparing wool for spinning.—Dated November 3, 1853. Sealed December 28, 1853.

2552. BRYAN EDWARD DUPPA, of Malmaynes-hall, in the county of Kent, Gentleman, for Improvements in colouring photographic pictures.—Dated November 3, 1853. Sealed December 28, 1853.

2561. WILLIAM GILBERT GINTY, of Manchester, Civil Engineer, for Improvements in the mode of manufacturing the combustible gases resulting from the decomposition of water or steam, and in the construction of apparatus connected therewith.—Dated November 4, 1853. Sealed December 28, 1853.

2575. JOHN RUBERY, of Birmingham, for Improvements in the manufacture of open caps for sticks of umbrellas and parasols.—Dated November 5, 1853. Sealed December 28, 1853.

2579. HENRY PERSHOUSE, of Birmingham, Manufacturer, and TIMOTHY MORRIS, of Birmingham, Manufacturer, for An improvement or improvements in the deposition of metals and metallic alloys. —Dated November 7, 1853. Sealed December 28, 1853.

2587. ALFRED VINCENT NEWTON, of Chancery-lane, for Certain improved means for preventing the fraudulent abstraction of property. —Dated November 7, 1853. Sealed December 28, 1853.—(A communication.)

2597. THOMAS DUNN, of the Windsor Bridge Ironworks, Pendleton, in the county of Lancaster, Engineer, JAMES BOWMAN, of Plaistow, in the county of Essex, Engineer, and JOSEPH DUNN, of Bellevue-terrace, in Pendleton aforesaid, Millwright, for Improvements in machinery for raising, moving, and lowering heavy bodies.—Dated November 9, 1853. Sealed December 28, 1853.

1037. GEORGE THOMAS DAY, of Burghfield Hill, Berkshire, Gentleman, for Improvements in travelling packages.—Dated April 29, 1853. Sealed December 29, 1853.

1574. ELIAS ROBISON HANDCOCK, of Pall-mall, in the city of Westminster, for Certain improvements in mechanism to decrease friction in propelling machinery, and to compensate for the wear thereof, and to strengthen the driving parts.—Dated June 30, 1853. Sealed December 30, 1853.

1575. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, London, for Improvements in the construction of submarine or subaqueous tunnels or ways.—Dated June 30, 1853. Sealed December 30, 1853.—(A communication.)

1606. PETER ERARD, of Marseilles, for Certain improvements in steam-boilers.—Dated July 6, 1853. Sealed December 30, 1853.

1588. JOHN ROLLINSON, of Kingswinford, in the county of Stafford, Engineer, and WILLIAM ROLLINSON, of Brierley Hill, in the county of Stafford, Engineer, for A new or improved apparatus for preventing explosions in steam-boilers.—Dated July 2, 1853. Sealed January 2, 1854.

1590. LEMUEL WELLMAN WRIGHT, of Chalford, in the county of Gloucester, Engineer, for Improvements in machinery or apparatuses for reducing and pulverizing gold and other metalliferous quarts and earth, and in separating metal therefrom.—Dated July 2, 1853. Sealed January 2, 1854.

1592. RICHARD ARCHIBALD BROOMAN, of Fleet-street, in the City

of London, for Certain machinery for converting caoutchouc into circular blocks or cylinders, and for manufacturing the same into sheets.—Dated July 2, 1853. Sealed January 2, 1854.—(A communication.)

1600. DECIMUS JULIUS TRIPE, of the Commercial-road East, in the county of Middlesex, Student in Medicine, for Improvements in locks.—Dated July 5, 1853. Sealed January 2, 1854.

1610. JOHN HOOD, of Glasgow, and WILLIAM HOOD, of the same place, Manufacturers, for Improvements in the treatment or manufacture of ornamental fabrics.—Dated July 6, 1853. Sealed January 2, 1854.

1614. JAMES BRADSHAW and THOMAS DAWSON, of Blackburn, in the county of Lancaster, for An improved shuttle skewer.—Dated July 6, 1853. Sealed January 2, 1854.

1599. MARCUS DAVIS, of 52, Gray's-inn-lane, in the county of Middlesex, Silent Carriage-maker, for Improvements in carriages, scaffoldings, and ladders, which scaffoldings and ladders are used as carriages.—Dated July 5, 1853. Sealed January 4, 1854.

1607. THOMAS NEWEY, of Garbett-street, Birmingham, Steel Pen Toolmaker, for Improvements in fastenings for wearing apparel.—Dated July 6, 1853. Sealed January 6, 1854.

1616. JOHN WOODWARD, of Platt-street, in the county of Middlesex, Office Clerk, for An apparatus for curling hair.—Dated July 6, 1853. Sealed January 6, 1854.

1628. WILLIAM ROBERTSON, of Rochdale, in the county of Lancaster, Machine-maker, for Improvements in machinery or apparatus for preparing, spinning, and doubling cotton wool, and other fibrous substances.—Dated July 8, 1853. Sealed January 6, 1854.

1633. PHILLIPPE POIRIER DE ST. CHARLES, of Fulham, in the county of Middlesex, Engineer, for Improvements in apparatus for measuring and indicating the distance travelled by cabs and other vehicles.—Dated July 8, 1853. Sealed January 6, 1854.

1636. EWALD RIEPE, of Finsbury-square, in the county of Middlesex, Chemist, for Improvements in the manufacture of turret or clock tower, and such like bells.—Dated July 9, 1853. Sealed January 6, 1854.—(A communication.)

1696. JEAN BAPTISTE JELIE, of Alost, Belgium, Thread Manufacturer, for Improved machinery for dressing or polishing thread.—Dated July 15, 1853. Sealed January 6, 1854.

1711. DONALD BRIMS, of Southwark-bridge-road, in the county of Surrey, Engineer, for An improved safety apparatus for the protection of life on water.—Dated July 19, 1853. Sealed January 6, 1854.

1806. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for An improved mode of regulating the electric light.—Dated August 2, 1853. Sealed January 6, 1854.—(A communication.)

2042. JOHN CLARE, of Liverpool, Produce Broker, for Improvements in the construction of iron houses, vessels, masts, spars, smoke funnels, boilers, cylinders, beams, and other like structures or articles.—Dated September 5, 1853. Sealed January 6, 1854.

2236. JAMES WILLIS, of Wallingford, in the county of Berks, Harness-maker, for Improvements in gig harness.—Dated September 17, 1853. Sealed January 6, 1854.

2388. GEORGE FREDERICK CHANTRELL, of Liverpool, Furnace

Engineer, for Improved apparatus applicable to the manufacturing and the revivification of animal or vegetable charcoal, and other useful purposes.—Dated October 17, 1853. Sealed January 6, 1854.

2458. JOHN FORDRED, of Dover, Gentleman, and THOMAS BOYLE, of Forest Gate, in the county of Essex, Gentleman, for Improvements in daylight reflectors, and in apparatus to be used in connexion therewith.—Dated October 25, 1853. Sealed January 6, 1854.

2480. THOMAS DUNN, of Windsor Bridge Ironworks, Pendleton, in the county of Lancaster, Engineer, and WILLIAM GOUGH, of Old Compton-street, Soho, in the county of Middlesex, Engineer, for Improvements in the manufacture of veneers, and in machinery and apparatus connected therewith.—Dated October 26, 1853. Sealed January 6, 1854.

2632. WILLIAM HADFIELD, of Manchester, Spinner and Manufacturer, for Certain improvements in looms for weaving.—Dated November 14, 1853. Sealed January 6, 1854.

2636. MATTHEW GRAY, of Glasgow, Engineer, for Improvements in weft forks for power looms.—Dated November 14, 1853. Sealed January 6, 1854.

1637. EWALD RIEPE, of Finsbury-square, in the county of Middlesex, Chemist, for Improvements in moulds for steel castings.—Dated July 9, 1853. Sealed January 9, 1854.—(A communication.)

1641. PIERRE AUGUSTE TOURNIERE, of Laurie-terrace, St. George's-road, in the county of Surrey, Gentleman, and LOUIS NICOLAS DE MECKENHELM, of Birmingham, Gentleman, for Improvements in the manufacture of soap and washing paste, and of the materials used therein.—Dated July 9, 1853. Sealed January 9, 1854.

1653. WILLIAM LEVESLEY, of Sheffield, for An improved method of making table-knife blades.—Dated July 12, 1853. Sealed January 9, 1854.

1736. WILLIAM HUNTLEY, of Ruswarp, near Whitby, Engineer, for Improvements in engines worked by steam, air, or fluids.—Dated July 23, 1853. Sealed January 9, 1854.

1757. THOMAS BANKS, of Derby, Mechanical Engineer, and HENRY BANKS, of Wednesbury, Iron Merchant, for Improvements in apparatus for retarding and stopping railway trains, which improvements are also applicable to vehicles travelling on common roads.—Dated July 26, 1853. Sealed January 9, 1854.

1785. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for An improved mode of producing an electric current.—Dated July 30, 1853. Sealed January 9, 1854.—(A communication.)

1919. WILLIAM HUNT, of Lee Brook Chemical Works, near Wednesbury, Manufacturing Chemist, for Certain improvements in manufacturing sulphuric acid.—Dated August 16, 1853. Sealed January 9, 1854.

1961. WILLIAM RETTIE, of Aberdeen, Lamp Manufacturer, for An improved construction of submarine lamp.—Dated August 23, 1853. Sealed January 9, 1854.

2065. ROBERT HARRINGTON, of Witham, in the county of Essex, Watch Maker, for Improvements in umbrellas and parasols.—Dated September 8, 1853. Sealed January 9, 1854.

2091. JAMES ATKINS, of Birmingham, Writing Clerk, for An im-

provement or improvements in ash-pits for grates.—Dated No 10, 1853. Sealed January 9, 1854.

2609. ALEXANDRE ANDRE VICTOR SARRAZIN DE MONTFERE South-street, Finsbury, London, Gentleman, for A new rotary engine.—Dated November 11, 1853. Sealed January 9, 1854.

2613. RICHARD DRYBURGH, of Leith, Cooper, for Improvem the means of holding staves while being cut.—Dated Novem 1853. Sealed January 9, 1854.

2621. JOHAN MARTIN LEVIEN, of Davies-street, Grosvenor- in the county of Middlesex, Upholsterer, for An improved co tion of expanding table.—Dated November 11, 1853. Sealed J 9, 1854.—(A communication.)

1645. GEORGE AGER, of Witham, in the county of Essex, (man, for An apparatus for holding and turning over the le music or music-books.—Dated July 11, 1853. Sealed January 11

1650. GEORGE DALTON, of Lymington, in the county of ampton, Gentleman, for Improvements in reverberatory and furnaces.—Dated July 11, 1853. Sealed January 11, 1854.

1651. FELIX LIEVEN BAUWENS, of Pimlico, in the county of dlesex, Manufacturer, for Improvements in the manufacture of c —Dated July 11, 1853. Sealed January 11, 1854.

1652. JOSEPH BACON FINNEMORE, of Easy-row, Birminghan nufacturer, for Improvements in sofa springs, useful for spring upholstery work generally, and in the adaptation thereof to matt —Dated July 12, 1853. Sealed January 11, 1854.

1658. JAMES FLETCHER, of Facit, near Rochdale, in the cou Lancaster, Manager, for Certain improvements in machinery u spinning, doubling, and winding cotton, wool, flax, silk, and fibrous materials.—Dated July 12, 1853. Sealed January 11, 1

1661. HENRY MONTAGUE GROVER, of Hitcham Rectory, county of Buckingham, Clerk, for A new method of finding and cating the measurements of the sines and cosines of the arcs of or other peripheries.—Dated July 13, 1853. Sealed January 13,

1663. THOMAS HILL BAKEWELL, of Dishley, Leicestershir Improvements in ventilating mines.—Dated July 13, 1853. January 13, 1854.

1667. ARNOLD MORTON, of Cockerill's-buildings, Bartholo close, in the city of London, Colour Manufacturer, for Improve in the manufacture of paints, pigments, and materials for house ing, paper staining, and decorative purposes generally.—Dated 13, 1853. Sealed January 13, 1854.

1672. WILLIAM HENDERSON, of Bow Common, in the cou Middlesex, Manufacturing Chemist, for Improvements in the con tion of furnaces for the purpose of obtaining products from o Dated July 14, 1853. Sealed January 13, 1854.

1707. WILLIAM BOGGETT, of St. Martin's-lane, in the city of minster, Gentleman, and WILLIAM SMITH, of Margaret street, county of Middlesex, Engineer, for Improvements in machin cleaning and polishing knives.—Dated July 18, 1853. Sealed Ja 13, 1854.

1758. THOMAS BUXTON, of Malton, in the county of York, Ag tural Implement Maker, for An improved mill for grinding.— July 26, 1853. Sealed January 13, 1854.

1767. ANGE LOUIS DU TEMPLE DE BEAUJEU, of South-street, Finsbury, London, Gentleman, for Improvements in rotatory engines.—Dated July 27, 1853. Sealed January 13, 1854.

1982. EUGENE DE VARROE, of Great Chesterfield-street, in the county of Middlesex, Artist, for Certain means of depriving caoutchouc of all unpleasant odour, and of imparting to it various agreeable perfumes.—Dated August 26, 1853. Sealed January 13, 1854.

1995. GEORGE ROBINSON, of Newcastle-upon-Tyne, Physician, for The novel application of the slags or refuse matters obtained during the manufacture of metals.—Dated August 27, 1853. Sealed January 13, 1854.

2111. LOUIS ACHILLE BROCOT, of Paris, Clock Manufacturer, for An improved construction of astronomical calendar.—Dated September 12, 1853. Sealed January 13, 1854.

2355. JOHN ELCE, of Manchester, Machine Maker, for Improvements in the machinery for preparing and spinning cotton and other fibrous substances.—Dated October 13, 1853. Sealed January 13, 1854.

2400. CHARLES PEYNAUD D'AZENE, of Essex-street, Strand, in the county of Middlesex, for Improvements in rendering sea-water fit for drinking, and all purposes where fresh water is ordinarily used.—Dated October 18, 1853. Sealed January 13, 1854.

2432. JAMES GARTH MARSHALL, Flax-spinner, and PETER FAIRBAIRN, Machinist, both of Leeds, for Improvements in machinery for combing flax, tow, wool, and other fibrous substances.—Dated October 21, 1853. Sealed January 13, 1854.

2557. JOSEPH HENRY TUCK, of Pall-mall, in the county of Middlesex, Engineer, for Improved machinery for obtaining and applying motive power, and for raising and forcing fluids.—Dated November 3, 1853. Sealed January 13, 1854.

2590. EDMUND HUGH GRAHAM, of the State of Maine, America, for New and useful improvements in fire-arms.—Dated November 8, 1853. Sealed January 13, 1854.

2603. WILLIAM BODGER, Lieutenant in the Royal Navy, of Shawfield-street, King's-road, Chelsea, for Improvements in anchors.—Dated November 10, 1853. Sealed January 13, 1854.

2628. THOMAS DE LA RUE, of Bunhill-row, for An improvement in the manufacture of paper.—Dated November 12, 1853. Sealed January 13, 1854.

2635. ALEXANDER CUNNINGHAME, of Glasgow, Ironmaster, for Improvements in the manufacture or production of sulphuric acid.—Dated November 14, 1853. Sealed January 13, 1854.

2646. JOHN HALL BROCK THWAITES, of Bristol, Dentist, and WILLIAM BIRD HERAPATH, also of Bristol, M.D., for Improvements in the manufacture of quinine and other alkaloids.—Dated November 16, 1853. Sealed January 13, 1854.

2654. JOHN RONALD, of Paisley, Manufacturer, for Improvements in fixing colours on yarns and cloths.—Dated November 16, 1853. Sealed January 13, 1854.

2662. JOHN CLARK, of Liverpool, Produce Broker, for Improvements in the manufacture of bar and sheet metals, in machinery connected therewith, and in the application of such metals, to various useful purposes.—Dated November 17, 1853. Sealed January 13, 1854.

2679. WILLIAM TAYLOR, of Park-street, Gloucester-gate, Regent's-park, for Improvements in anchors.—Dated November 18, 1853. Sealed January 13, 1854.

2680. JAMES MELVILLE, of Roebank Works, Lochwinnoch, Renfrew, Calico Printer, for Improvements in printing textile fabrics and other surfaces.—Dated November 18, 1853. Sealed January 13, 1854.

2682. MOSES POOLE, of the Avenue-road, Regent's-park, in the county of Middlesex, for Improvements in surface condensers, and in evaporaters and heaters for steam-engines.—Dated November 18, 1853. Sealed January 13, 1854.

2694. JOHN GERALD POTTER, Carpet Manufacturer, and ROBERT MILLS, Designer, both of Darwen, in the county of Lancaster, for Certain improvements in the manufacture of carpets.—Dated November 19, 1853. Sealed January 13, 1854.

2711. ALFRED BIRD, of Birmingham, Chemist, for Certain improvements in apparatus to be employed for the purpose of communicating signals on railway trains and railways, which improvements are also applicable to other similar purposes.—Dated November 22, 1853. Sealed January 13, 1854.

2714. FREDERICK LEVICK, of Cwm Celyn and Blaina Iron Works, Monmouthshire, Ironmaster, and JOSEPH FIELDHOUSE, of the same place, Engineer, for Improvements in machinery for raising coal and minerals from collieries and mines.—Dated November 22, 1853. Sealed January 13, 1854.

2830. JOHN MOLD, of Portland-terrace, Westmoreland-road, Walworth, in the county of Surrey, for Improvement or addition to augment convenience by transformation and facility the different lines required in the erection or manufacturing edifices or structures, by apparatus, tools, or instruments suitable for the different capacities of operatives, and general surveying.—Dated December 6, 1853. Sealed January 13, 1854.

1584. PHILIP HART, of Brierly-hill, in the county of Stafford, Agent, for Improvements in the manufacture of coke.—Dated July 1, 1853. Sealed January 14, 1854.

1675. GEORGE HUMPHERY, of Brighton, Engineer, for Improvements in regulating the supply of water for water-closets.—Dated July 14, 1853. Sealed January 14, 1854.

1679. BENJAMIN LOOKER, of Kingston-on-Thames, in the county of Surrey, for Improvements in the manufacture of bricks.—Dated July 14, 1853. Sealed January 14, 1854.

1682. ROBERT GORDON, of Heaton Norris, in the county of Lancaster, Millwright and Engineer, for Improvements in furnaces used with steam-boilers for the purpose of consuming smoke and economising fuel.—Dated July 15, 1853. Sealed January 14, 1854.

1683. HENRI JOSEPH D'HUART, of Longivy, France, for Certain improvements in the manufacture of pottery.—Dated July 15, 1853. Sealed January 14, 1854.

1699. HENRY LAMPLOUGH, of Gray's-inn-lane, for Improvements in the preparation and manufacture of certain effervescing beverages.—Dated July 16, 1853. Sealed January 14, 1854.

1705. JOHN WALLACE DUNCAN, of Grove End-road, St. John's Wood, in the county of Middlesex, Gentleman, for Improvements in adhesive soles and heels, and in apparatus used for preparing and applying the same.—Dated July 16, 1853. Sealed January 14, 1854.

1706. ISAIE ALEXANDRE, of Bruxelles, Merchant, for Improvements in metallic pens and penholders.—Dated July 18, 1853. Sealed January 14, 1854.

1710. SAMUEL PERKES, Civil Engineer, of Walbrook, City of London, for Improvements in the construction of portable metallic folding bedsteads, chair bedsteads, chairs, sofas, couches, settees, and such like articles for the use of emigrants and others, and part of which improvements are applicable to ordinary bedsteads, sofas, couches, chairs, and such like articles in general.—Dated July 18, 1853. Sealed January 14, 1854.

1717. EDWARD DALTON SMITH, of Hertford-street, May-fair, in the county of Middlesex, for Improvements in crushing and washing ores and earths.—Dated July 20, 1853. Sealed January 14, 1854.

1745. WILLIAM IRELAND, of Leek, in the county of Stafford, Gentleman, for Improvements in the mode or method of melting or fusing iron or other metals, and in the apparatus employed therein.—Dated July 25, 1853. Sealed January 14, 1854.

1769. CHARLES CUMMINS, of Leadenhall-street, in the City of London, Chronometer Maker, for Improving clock escapements.—Dated July 28, 1853. Sealed January 14, 1854.

1793. JOHN SHAE PERRING, of Bury, in the county of Lancaster, Civil Engineer, for Improvements in the permanent way of railways.—Dated August 1, 1853. Sealed January 14, 1854.

1808. MATTHIAS EDWARD BOURA, of Crayford, Kent, India Rubber Manufacturer, for Improvements in supplying ships or other vessels with water, air, or ballast.—Dated August 2, 1853. Sealed January 14, 1854.

1863. SAMUEL HALL, of Chadwell-street, Pentonville, in the county of Middlesex, for Improvements in furnaces.—Dated August 10, 1853. Sealed January 14, 1854.

1903. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, in the county of Middlesex, Gentleman, for Improvements in dyeing or colouring textile fabrics and materials, and in the machinery or apparatus connected therewith.—Dated August 13, 1853. Sealed January 14, 1854.—(A communication.)

1914. EDWARD FINCH, of Bridge Works, Chepstow, Engineer, and CHARLES LAMPORT, of Workington, Ship Builder, for Improvements in the masts and rigging of ships.—Dated August 16, 1853. Sealed January 14, 1854.

2326. WILLIAM BEARDMORE, of Deptford, in the county of Kent, Engineer, and WILLIAM RIGBY, of Glasgow, for Certain improvements in steam-engines.—Dated October 11, 1853. Sealed January 14, 1854.

2335. JAMES WEBSTER, of Leicester, Engineer, for Improvements in water guages for steam-boilers.—Dated October 11, 1853. Sealed January 14, 1854.

2591. HUMPHREY CHAMBERLAIN, of Kempsey, near Worcester, for Improvements in the manufacture of bricks and tubes or tiles.—Dated November 8, 1853. Sealed January 14, 1854.

2605. SAMUEL MEAD FOLSOM, of Massachusetts, America, for A new or improved instrument for ironing clothes or various other articles.—Dated November 10, 1853. Sealed January 14, 1854.—(A communication.)

2645. JOHN CAMERON and JAMES NAPIER, both of Loughor, in

the county of Glamorgan, Practical Chemist, for Improvements in obtaining gold and silver from ores, alloys, or compounds containing such metals.—Dated November 15, 1853. Sealed January 14, 1854.

2653. PHILIP HILL, of Gravel House, Coggeshall, Essex, for Improvements in weaving plush and other piled fabrics.—Dated November 16, 1853. Sealed January 14, 1854.—(Partly a communication.)

2668. CHARLES BURTON, of New Oxford-street, in the county of Middlesex, Carriage Manufacturer, for Certain improvements in hand and draught carriages for common roads.—Dated November 17, 1853. Sealed January 14, 1854.

2685. HENRY RICHARD COTTAM, of Sussex-terrace, Hyde Park-gardens, for Improvements in the construction of portable houses.—Dated November 18, 1853. Sealed January 14, 1854.

2717. WILLIAM PEGG, of Leicester, for Improvements in instruments for cutting out parts of garments and other articles, and in grinding and sharpening cutters for the same.—Dated November 22, 1853. Sealed January 14, 1854.

2722. JOHN FIELDING EMPSON, of Birmingham, Manufacturer, for Improvements in the manufacture of wire.—Dated November 23, 1853. Sealed January 14, 1854.

2730. THOMAS WILLIAM KINDER, of Dublin, Engineer, for Improvements in the construction of the permanent way of railways.—Dated November 23, 1853. Sealed January 14, 1854.

2738. ELMER TOWNSEND, of Massachusetts, America, for New and useful improvements in machinery for sewing cloth or other material.—Dated November 24, 1853. Sealed January 14, 1854.—(A communication.)

2747. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, in the county of Middlesex, Gentleman, for Improvements in carding engines for carding cotton and other fibrous materials.—Dated November 25, 1853. Sealed January 14, 1854.

2819. CHARLES WILLIAM HOCKADAY, of Port Hall, Brighton, Gentleman, for Certain chemical compound or compounds applicable as a remedy or remedies for scorbutic and other affections of the human body.—Dated December 5, 1853. Sealed January 14, 1854.

1712. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for A new mode of fastening buttons to garments, and an improved button, and also in machinery for manufacturing the same.—Dated July 19, 1853. Sealed January 19, 1854.—(A communication.)

1714. CHARLES BREESE, of Birmingham, Japanner, for A method of forming designs and patterns upon papier maché, japanned iron, glass, metal, and other surfaces.—Dated July 19, 1853. Sealed January 19, 1854.

1729. JAMES MURDOCH, of Staple's-inn, in the county of Middlesex, for An improvement in stamping or shaping metals.—Dated July 22, 1853. Sealed January 20, 1854.—(A communication.)

2025. RICHARD ARCHIBALD BROOMAN, of Fleet-street, City of London, for An improvement in paddle-wheels.—Dated August 31, 1853. Sealed January 20, 1854.—(A communication.)

2437. SAMUEL LLOYD, of Wednesbury, in the county of Stafford, for Improvements in the construction of turn-tables.—Dated October 21, 1853. Sealed January 20, 1854.

2549. JOHN MOFFAT, of Birmingham, Manufacturer, for An im-

provement or improvements in candlesticks.—Dated November 3, 1853. Sealed January 20, 1854.

1723. JOHN TILLEY, of Thingwall, in the parish of Woodchurch, in the county of Chester, Merchant, for separating the refuse vegetable matter contained in the stalk and leaves of the plantain species, and also in trees grown in tropical climates from the fibrous material of the same, in order that the latter may be manufactured into ropes or cordage, and for other purposes for which hemp and flax are used. —Dated July 21, 1853. Sealed January 21, 1854.

1724. WILLIAM BIRKETT, of Manningham Mills, Bradford, Chemist, for A method of cleansing or purifying and treating soap-suds or wash-waters, so as to fit them to be again used for the washing of wools, and other similar matters.—Dated July 21, 1853. Sealed January 21, 1854.

1725. SIMON CHARLES MAYER, of Paris, for An improved domino bearer.—Dated July 21, 1853. Sealed January 21, 1854.

1728. EDWARD COCKEY, HENRY COCKEY, and FRANCIS CHRISTOPHER COCKEY, of the Frome Iron Foundry, Frome, in the county of Somerset, for Improvements in the manufacture or production of cheese.—Dated July 21, 1853. Sealed January 21, 1854.

1732. JOHN GILLAM, of Woodstock, Gentleman, for Improvements in apparatus for cleansing and separating corn, grain, and other seeds.—Dated July 22, 1853. Sealed January 21, 1854.

1739. JOHN HALL, of Bedford, Machinist, for An improved mangle. —Dated July 23, 1853. Sealed January 23, 1854.

1741. SAMUEL BARLOW, of Stakehill, in the county of Lancaster, Bleacher, and JOHN PENDLEBURY, of Crumpsall, in the same county, Bleacher, for Certain improvements in machinery or apparatus for bleaching or cleansing textile fabrics or materials.—Dated July 23, 1853. Sealed January 23, 1854.

1744. ALEXANDER CLARK, of Gate-street, Lincoln's-inn-fields, in the county of Middlesex, Engineer, for Improvements in regulating the speed and indicating the power of steam and other motive-power engines.—Dated July 25, 1853. Sealed January 23, 1854.

1886. GEORGE PEEL, of the city of Manchester, Engineer, and ROBERT BROWNHILL, of the same place, Manager, for Improvements in air-pump buckets, and in valves for steam-engines, and other purposes.— Dated August 13, 1853. Sealed January 23, 1854.

1989. JAMES HILL, of Stalybridge, in the county of Lancaster, Cotton-spinner, for Certain improvements in machinery used for spinning, doubling, and winding cotton, wool, flax, silk, and other fibrous materials.—Dated August 27, 1853. Sealed January 23, 1854.

2423. JOHN FRANCE, of North Wharf-road, Paddington, in the county of Middlesex, for An improved morticing machine.—Dated October 20, 1853. Sealed January 23, 1854.

1778. WILLIAM WILD, of Salford, in the county of Lancaster, Iron Moulder, for Improvements in machinery or apparatus for covering rollers used in the manufacture of cotton and other textile materials with cloth, leather, or other substances.—Dated July 29, 1853. Sealed January 25, 1854.

1794. SAMUEL C. LISTER, of Manningham, in the county of York, for Improvements in machinery for washing wool and hair.—Dated August 1, 1853. Sealed January 25, 1854.

1822. GEORGE ARMITAGE, of Bradford, York, Dyer, for Improvements in the construction of presses.—Dated August 4, 1853. Sealed January 25, 1854.

1846. RICHARD CHRISTY, of Fairfield, in the county of Lancaster, Manufacturer, and JOHN KNOWLES, of the same place, Manager, for Improvements in the manufacture of terry cloth, or other woven fabrics having looped surfaces, and in the machinery or apparatus connected therewith.—Dated August 8, 1853. Sealed January 25, 1854.

1862. THOMAS MACSWENY, of America-square, in the city of London, for Improvements in the construction of ships and vessels.—Dated August 10, 1853. Sealed January 25, 1854.

1894. ROBERT SMITH BARTLEET, of Redditch, in the county of Worcester, for Improvements in apparatus used for sewing.—Dated August 12, 1853. Sealed January 25, 1854.

2622. STEPHEN BARKER, of Birmingham, Manufacturer, for An improvement or improvements in shaping metals.—Dated November 12, 1853. Sealed January 25, 1854.

2644. JOHN LIDDELL, of Glasgow, Merchant, for An improvement or improvements in power loom weaving.—Dated November 15, 1853. Sealed January 25, 1854.

2648. JOSEPH FRY, of Cannon-street, in the city of London, Merchant, for Improvements in preparing solvents for india-rubber and gutta-percha, and in rendering waterproof fabrics free from odour.—Dated November 15, 1853. Sealed January 25, 1854.

2718. FRANCIS ARDING, of the Albert Iron Works, Uxbridge, in the county of Middlesex, Agricultural Implement Manufacturer, for Improvements in machinery for cutting, splitting, and bruising vegetable substances.—Dated November 22, 1853. Sealed January 25, 1854.

2742. DAVIDSON NICOL, of Edinburgh, Stationer, for Improvements in the manufacture of envelopes.—Dated November 25, 1853. Sealed January 25, 1854.

2808. GEORGE COLLIER, of Halifax, Mechanic, for Certain improvements in looms for weaving.—Dated December 2, 1853. Sealed January 25, 1854.

2810. SAMUEL C. LISTER, of Bradford, York, Manufacturer, for Improvements in combing wool, hair, cotton, and other fibrous materials. —Dated December 2, 1853. Sealed January 25, 1854.

2812. JONATHAN SAUNDERS, of St. John's-wood, in the county of Middlesex, for Improvements in the manufacture of rails for railways. —Dated December 2, 1853. Sealed January 25, 1854.

2838. JOHN HARGRAVE, of Kirkstall, in the county of York, Worsted Manufacturer, for Certain improvements in apparatus for washing and scouring wool.—Dated December 6, 1853. Sealed January 25, 1854.

1766. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for Certain improvements in the manufacture of tiles for roofing.—Dated July 27, 1853. Sealed January 25, 1854. —(A communication.)

THE

REPERTORY

OF

PATENT INVENTIONS.

No. 3. Vol. XXIII. ENLARGED SERIES.—MARCH, 1854.

Specification of the Patent granted to Benjamin Burrows, *of Leicester, Designer, for Improvements in Jacquard Apparatus.*—Dated July 16, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object a peculiar combination of jacquard apparatus, in order to arrange the same in a manner suitable for opening two sheds simultaneously or separately for the passage of two shuttles, one on each side of a central warp. For this purpose the usual lifting wires are employed, and those which are selected by the cards are moved up by the griff or frame to make the upper shed, in a similar manner to that ordinarily practised; but the perforated board on which the lower ends of the lifting wires rest, is caused to descend together with the unselected wires, by which a lower shed is opened simultaneously with the upper one, thus admitting of two shuttles being thrown across, the one under, and the other over, a middle warp or by cross-mounting, and giving separate movements to these parts, varied effects may be produced, and two sheds opened

according to the effect desired to be obtained. And in order that my invention may be more fully understood and readily carried into effect, I will proceed to describe the means pursued by me.

Description of the Drawing.

The drawing shows a vertical section of a jacquard machine or apparatus suitably arranged for carrying out my present improvements, and as the nature and working of the apparatus is in many respects similar to the jacquard apparatus, in general use and well understood, it will only be necessary to give a particular description of those parts which constitute my present improvements, so as to enable persons acquainted with this class of machinery to understand and carry out my invention. *a*, *a*, is the framing of the machine; *b*, is an axis supported in bearings at each end of the machine; *c*, is a lever fixed on one end of the axis, *b*, by which a rocking motion is communicated to the axis, *b*, in any convenient manner; *d*, d^1, are cross-pieces or rocking levers fixed on each end of the shaft or axis, *b*, by which a rising and falling movement is given to the griff frame, *e*, and to the perforated board or frame, *f*, which supports the lifting wires, *g*; the lever arms, *d*, are connected at each end of the machine to the griff frame, *e*, by links or connecting rods, e^1, the lever arms, d^1, being connected by links or connecting rods, f^1, to the guides, f^2, which support the perforated board or frame, *f*; e^2, are guide rods affixed to the griff frame at each end of the machine; g^1, g^1, are loops formed in the lifting wires, *g*, which rest upon the perforated board or frame, *f*, and by which the unselected wires are supported in their descent to form a shed below a central warp at the same time that the selected wires raise their warp threads to form a shed above a central warp, which may be either a stationary warp or under the control of jacquard apparatus, so as to work with the upper or under shed, as the nature of the fabric may require; *h*, is the jacquard cylinder, and *i*, *i*, are the needles, which are of the ordinary construction, and the action of these parts being the same as those in common use and well understood, it will not be necessary to give a more particular description thereof.

In the above description the opening of the two sheds is simultaneous, which is what I prefer, but a mechanic will readily see that the apparatus may be varied so as to open

the two sheds separately, and so that the opening of one might precede the opening of the other. When employing two jacquard apparatus and cross-mountings, as have heretofore been practised, two sheds may be opened, as above explained, by either or both of such apparatus, according to the effect desired to be obtained; or jacquard apparatus, according to my invention, may be so arranged that some of the rows of wires may be worked with a stationary board, as heretofore, and other of the rows of wires may have moveable boards, with the power of opening two sheds, as above described.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I do not confine myself to the precise details herein shown and described.

But what I claim is, the mode of combining jacquard apparatus, herein described.—In witness, &c.

BENJAMIN BURROWS.

Specification of the Patent granted to JONATHAN AMORY, *of Boston, United States of America, for Improvements in Furnaces.*—Dated September 9, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improvements are designed for the purpose of effecting a saving in the quantity of fuel consumed in heating locomotive, marine, and other steam-boilers, and are more particularly applicable to "Baker's Steam-boiler Furnace," so called. This desideratum of economizing the fuel is effected by supplying the fire with hot air instead of cold air, thereby rendering the combustion of fuel more uniform and perfect. In "Baker's Furnace," as is well known, the unconsumed gases and other volatile products which emanate from fuel are retarded in their passage to the chimney or delivering flue, by a series of reverberatory chambers of semi-elliptical form, leading from the fire-place through which the said products are circulated, and retained long enough to exhaust their heat, deliver the same to the boiler and ensure their perfect combustion before they are permitted to escape. The passages or chambers under the boiler are

thus kept constantly heated, and it is by taking advantage of this circumstance that I am enabled to convey hot air instead of cold air to the burning fuel.

My improvements are represented in the accompanying drawings, of which,

Fig. 1, is a central longitudinal vertical section of one of "Baker's furnaces," with my additions thereto; and

Fig. 2, a transverse vertical section of the same, taken through the fire chamber. *a*, *a*, in the said drawings represents a steam-boiler; *b*, *b*, the fire chamber under one end of the same, and *c*, *c*, the ash pit; *d*, *d*, &c., are a series of reverberatory chambers of a curved or semi-elliptical form, communicating with the fire chamber, *b*, *b*, and formed by the fire bridges, *e*, *e*, and *c*. These chambers, *d*, *d*, also communicate by means of the spaces, *f*, *f*, with a series of ovens, *g*, *g*, under the fire bridges, *e*, *e*. The smoke, gases, and other volatile products which escape from the fuel pass from the fire chamber, through the throat formed between each fire bridge, *e*, *e*, and the bottom of the boiler into the chambers, *d*, *d*, and by the peculiar form of these chambers are made to revolve and circulate in the same, till they are entirely consumed and their heat delivered to the boilers. Thus it will be seen that the ovens, *g*, *g*, which communicate with the chambers, *d*, *d*, by the passages or spaces, *f*, *f*, and supply oxygen to the chambers, *d*, *d*, are kept constantly hot. In order to make use of this heat in the ovens, *g*, *g*, I insert near the bottom of the same and through the fire bridges, *e*, *e*, a pipe or tube, *h*, *h*, one end of which passes into the ash pit, *c*, *c*, (kept tightly closed,) under the fire chamber, *b*, *b*. The other end enters into an air chamber or passage, *i*, which leads into the open air. The cold air which thus enters the pipe, *h*, *h*, through the chamber, *i*, becomes gradually heated by passing through the said pipe, which is kept hot by the circulation of the heated currents in the ovens, *g*, *g*, and passes directly into the ash pit, *c*, *c*, whence it passes up through the grate, *k*, *k*, to the fuel, thus supplying hot air to the fire chamber, *b*, *b*, and ensuring a more perfect combustion, and consequently requiring less fuel, as will readily be understood without further suggestions.

It will be seen from the foregoing description that the pipe, *h*, *h*, is kept hot not by supplying to it heat produced by extraneous means, but simply by the heat already produced in the ovens from the main fire chamber, *b*, *b*, and

that consequently hot air is supplied to the fuel in an exceedingly simple and efficacious manner; while the pipe, *h*, *h*, and the air which enters the same gradually increase in heat as it approaches towards the fire chamber.

The pipe, *h*, *h*, may extend only through a few of the ovens, *g*, *g*, or may be extended through the whole series, as shown at *l*, *l*, or even extended through the whole length of the furnace, as shown at *m*, *m*.

In fig. 2, a series of boilers, *a*, *a*, *a*, are represented, with three pipes, *h*, *h*, *h*, leading into the ash pit, showing, as will readily be understood, that any number of conducting pipes may be used and applied to any number of boilers.

The heating apparatus, as above described, is represented as placed under the boiler, but it will be evident that instead of being so arranged the whole series of reverberatory chambers, ovens, &c., with the pipe, *h*, *h*, attached, can be placed within and encased by the boiler.

What I claim is, the combination with "Baker's Furnace," so called, or a furnace constructed with reverberatory chambers, with a series of ovens under them, of a pipe or pipes, one end of which communicates with the ash pit under the main fire chamber, and the other end with a cold air chamber or the external atmosphere, and passes through the heated ovens or chambers formed under the boiler or boilers, whereby I am enabled to supply hot air to the fuel, as above set forth.—In witness, &c.

JONATHAN AMORY.

Specification of the Patent granted to ROBERT SMITH BARTLEET, ***of Redditch, for Improvements in the Manufacture of Sewing Machine Needles.***—Dated July 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists, when the stems are smaller at one end than the other, of forming the stems of such needles by stamping or pressing in dies, in place of the ordinary grinding and filing. The dies for this purpose are made of steel, and the steel wire of the proper length is placed between the dies, and by stamping or pressing the dies together the desired form in the rough is obtained, and the

same is then finished into a needle by filing and grii
and it also consists of forming the points and groove
impressions for the eyes of such needles simultaneou
stamping or pressing in dies, by which means great
actness and similarity of form may be obtained.
make sewing-machine needles having points with a
sides, or with lancet points, or with two convex sides
or without cutting edges, and with or without groo
recesses for the thread. I also make sewing-machine n
with knobs at the ends.

I burnish the eyes of such needles by threading th
a wire, and causing them to revolve or pass rapidly th
or the needles may be stationary, and the wire m
revolve in or pass rapidly through the eye.

Having thus stated the nature of my said invent
will proceed to describe the manner in which I perfo
same.

Description of the Drawing.

Fig. 1 and fig. A[1], show a sewing-machine needle
formed, (by pressure between dies,) which is smaller
end than another.

Fig. 2, shows a plan of one of two dies, by which
tion of steel wire is pressed into the form.

Figs. 3, shows an end view of parts of the two die
the wire between them. Heretofore, in making s
machine needles, where the stems have required to
smaller size at one end than the other, it has been us
reduce the wire by grinding or removing the substa
one end. Now, by my invention, I cause the wire
pressed between dies, and thus by compression to for
smaller part of the stem, which will be found to be a
more advantageous mode of working than that fo
practised.

Fig. 1, shows a sewing-machine needle partly form
dies and pressure. The fins on the sides of fig. 1 are
removed by clipping and filing, and the piece of wir
annealed, according to circumstances, when it is again
pressed between dies suitably sunk, according to th
of needle intended to be produced.

Fig. 4, shows a longitudinal section of parts of two

Fig. 5, plans of the same; and

Fig. 6, shows a piece of wire, fig. 1, after it has
again pressed between dies, and by which process of

sure the eye has been formed, the grooves to the eye on either side of the stem have been impressed and the point roughly formed, and these results have been simultaneously produced by the dies and pressure.

I would remark that the form of these dies may varied according to the configuration desired to be given to the sewing-machine needles to be shaped therein. The needles thus far formed are then to be brought into their finished form by clipping and filing.

Fig. 7, shows two views of a sewing-machine needle with an angular or lancet point, or in place of two angular edges to the point, it may be formed with more angular edges by having the dies sunk accordingly.

Fig. 8, is a plan of one of two dies used in shaping this needle. These needles, after being roughly formed by the dies, are to have the burs removed, and they are then to be finished in the ordinary manner.

Fig. 9, shows two views of a sewing-machine needle, with a knob at one end to facilitate the holding of it in the machine. These knobs or heads are solid with the stem, and are made by forcing up the end in dies, in like manner to those used in making solid-headed pins, and the grooves, the eye, and the rough point are to be made in dies, as before explained. The eyes of all these sorts of sewing-machine needles are to be burnished by revolving them on a wire, which may be smooth or roughed like a file, by passing them rapidly thereon, or by revolving a wire within them, or passing a wire rapidly through them.

Having thus described the nature of my said invention, I would state that I am aware that dies and pressure have before been used in the manufacture of sewing and other needles, I do not therefore claim generally the use of dies and pressure in the manufacture of needles.

But what I claim is,

First, the manufacture of the stems for sewing-machine needles when smaller at one end than at the other, by means of dies and pressure, as herein described; and

Secondly, I claim the simultaneous making by dies and pressure of the points, grooves, and impressions for the eyes of sewing-machine needles. Also, the making of such needles having points with angular sides, and of sewing-machine needles with nobs at the ends, and the burnishing

of the eyes of such needles with wire, either smoo
roughed as a file.—In witness, &c.

ROBERT SMITH BARTLE

Specification of the Patent granted to ROBERT GRIFF
of No. 25, *Great Ormond-street, in the County of*
dlesex, for Improvements in giving Motion to Dri
Dated Dec. 24, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &
This invention consists of applying a circular ratchet
face to the handle and a similar circular ratchet surfa
the socket of the drill, the two ratchet surfaces being
stantly pressed towards each other by springs, by w
when the handle is moved in one direction, the teeth
ratchet-surfaces will interlock, and motion will be giv
the drill, whilst in the back motion of the handle the ra
teeth of the one ratchet surface will rise and pass
over the ratchet-teeth or the other ratchet-surface.

My improvement consists in the employment of
ratchet-wheels in the ratchet-brace in such a manner
all the teeth of the ratchet-wheels are in gear at the
time, by which means a great increase of streng
obtained, and are entirely inclosed in the handle o
ratchet-brace, as shown in the drawings.

Description of the Drawing.

Fig. 1, is a side view, one half full size, of a ra
brace with my improvements applied.

Fig. 2, a longitudinal section of the same.

Fig. 3, a section or plan.

Fig. 4, the drill-stock with the fixed ratchet-wheel fc
upon it.

Fig. 5, the moveable ratchet-wheel, which slides upo
drill-stock within the handle, and being hexagon, as s
in fig. 3, is moved by it, and is pressed downwards to
the fixed ratchet by means of the coiled spring,
fig. 2.

Fig. 7, is a side view of another form of ratchet-brace, by which I give a continuous action to the drills by means of the bevil wheels in conjunction with two sets of crown ratchet-wheels.

Fig. 6, longitudinal section of ditto.

Fig. 8, section on plan.

Fig. 9, drill-stock, showing two fixed ratchet wheels; one being formed upon the stock and the other secured upon it, and fixed by means of a small screw passing partly through the wheel and partly through the stock.

Fig. 10, the moveable ratchet-wheels, which slide upon the stock within the bevil wheels and partake of their motion, as in the former case, and are pressed towards their respective fixed ratchets by the coil spring shown between them.

Having thus described my invention, and the manner of performing the same, be it understood that I do not confine myself to the exact details herein described, so long as the peculiar character of my invention is retained.

But what I claim is, the employment of crown ratchet-wheels in ratchet-braces, or instruments employed in giving motion to drills as herein described.—In witness, &c.

ROBERT GRIFFITHS.

Specification of the Patent granted to LANSING E. HOPKINS, ***of the City and County of New York, in the State of New York, for the Manufacture of Hat Bodies of Fur and other like Substances.***—Dated July 26, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Two difficulties have arisen in the construction of hat bodies on an exhausted cone, which are, wetting the fibres, in some way, before they were removed from the cone, and, secondly, a want of compactness and consistency at that period of their manufacture. To wet the stock at this period, and then drying it before completing the manufacture, seriously injures it, compelling the manufacturers at once to work up the hat bodies as fast as they are formed or to seriously injure their property, and this in practice is found impossible. The bodies are made and sold to the trade

who manufacture them into hats from time to time afterwards. No method has been heretofore adopted of hardening the bodies without wetting them with water before they are taken from the cone, which I avoid in my process.

The apparatus is constructed as follows:—I employ an endless feed apron, *a*, and rollers, *b*, together with a cylinder, *c*, armed with points, called a "picker," all of which devices have long since been known and used in the manufacture of fur, and are well understood. Below this picker I have a recess, *d*, which I call an enclosed air chamber, this chamber communicates by a trunk or pipe, *e*, with the exhausting fan hereafter described; through this chamber a current of air is driven by the exhaust fan past the picker, driving forward the fur towards the cone, *f*, on which the hat body is to be formed. The exhaust fan, *g*, is a well known device for exhausting the air from the cone upon which the hat body is formed, and the air passing into it is driven forward into the air chamber above named, which may also receive an additional supply from the fans, *h*, at the sides of the picker. Upon the side of the cone opposite that at which the fur is received, I place a set of three, more or less conical rollers, *i*, which press against the surface of the cone, and turn as the cone revolves. On the curved part of the tip are several small rollers, clearly shown at fig. 2, which fit and adapt themselves to the curve, thus rolling over every part of the surface, and pressing down the fur as it is worked, and to facilitate the interlocking and hardening the body to a consistency, I cause the rollers to have an end chase by making the inequalities in the revolving rim, upon which the cone sets, as at *k*, against which the ends of the journals of the rollers, *i*, rest, to move them up and down a long pipe, *o*, having a slit its whole length and curved to the section of the cone, may be employed by covering the slit above named with cloth, and letting a slight breath of steam out upon the fur, simply to warm, but not to saturate it; this as well as the rollers are jointed so as to be thrown back from the cone at pleasure. Before the cone is used it is covered with a thin cloth cover made to fit it, which comes off with the body when made, and is then easily removed from it. The steam tube is small and wound with cloth, and then a casing also having a slit in it, is put on over the cloth to cover it; this is shown in fig. 3. *m*, is the casing; *n*, the tube covered with cloth,

and *o*, the steam tube before the cloth is put on; this is an important construction and is thus named and illustrated in detail. The purpose of the cloth cover over the cone is two-fold; first, experience shows that the fur, when formed directly upon the perforated metal cone, slides down in little rolls, occasionally injuring the fabrics and giving much trouble; this the cloth entirely prevents, and as it is taken off with the fur body, it can, if necessary, be retained in the body to further harden it before being finally removed, while at the same time the operation goes on without removing the cone from its seat.

Instead of making the conductor as above described and shown, I sometimes make it in two parts curving them around so as to have their openings opposite each other, or nearly so, and then placing the cone between them, and this device I prefer in making the best quality of hats as it lays the fur better.

The construction of that part of the machine by which this new effect is produced, consists of two tubes of curved form, uniting in one at the picker (which is one of ordinary construction), from thence the tubes run a short distance parallel, having but a single partition between them, they then branch outward with a gentle curve, and their cross section gradually narrows in breadth and increases in height, their extreme ends curving inwards till their openings are opposite each other; between these openings stands the cone upon which the hat bodies are formed on either side of the tubes near their extreme ends, are sliding shutters, that can be made to slide forward, and by so doing in some degree close the opening; by regulating these shutters on one or the other, or both, I produce the effect above named of strengthening the body in any desired part. I effect this by the double outlet with more accuracy than could be done in any other way, throwing the fur upon the cone in more than one point.

I claim in the above device, in combining the hardening rollers with the perforated cone by means of a yielding or hinged frame, in which they are placed, substantially in the manner and for the purpose herein described.

I also claim giving to said rollers in combination with said perforated cone, a vibrating endwise motion as well as a rotary motion, substantially as described and for the purpose set forth.

I also claim blowing the exhaust air from the former, *f*,

into the chamber, *d*, for the purpose and in the manner described; and,

I also claim the mode of forming the steam pipe outlet, as above specified, by covering the steam pipe with cloth, and in casing it with an outer metal case.

I also claim covering the perforated cone, preparatory to a deposition of fur thereon, with a covering of thin cloth easily pervious to air, upon which the fur is to be deposited, said cloth or fabric to be removed at each operation with the hat body deposited thereon.

I also claim the bifurcated conductor and blast above described, said conductor having its opening opposite each other, or nearly so, and having the cone between them, substantially in the manner and for the purpose set forth.—In witness, &c.

LANSING E. HOPKINS.

Specification of the Patent granted to GEORGE DALTON, *of Lymington, in the County of Southampton, Gentleman, for Improvements in Reverberatory and other Furnaces.* —Dated July 11, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention consists of an improved mode of introducing atmospheric air to the fire places of reverberatory and other furnaces, and the improvement consists in causing the air to enter through openings at the front or at the sides of the furnace, as may be found most convenient, and after traversing by means of suitable flues or channels such as have before been used, the sides, bottom, or other heated surfaces of the furnace, so as to collect as much as possible of the waste heat, causing such heated air to pass into the closed ash pit below the fire bars through perforations or openings in cast iron plates or other suitable material surrounding the ash pit or parts thereof; and I find great advantage in having the perforations at the sides graduated, as shown in the drawing, whereby the heated air is more suitably distributed to all parts of the closed ash pit. The ash pit is to be entirely closed in front, which can be done in any convenient manner, such as by a door moving up and

down between guides and lifted by a lever fixed to one side of the furnace or by folding doors. When the latter mode is preferred I recommend the doors to be made shorter than the opening into the ash pit, and the upper part of such opening to be covered by a flap moving freely on hinges and overlapping the doors; which flap will be found useful in keeping the doors closed and enabling the fireman conveniently to rake the fire.

I sometimes cause a portion of the heated air to enter the fire place above the fire bars through perforations in plates of cast iron or other suitable material such as have been heretofore employed, but I make no claim of novelty in respect of the mode of introducing heated air into the fire place above the fire bars, except in combination with the mode herein described for introducing heated air into the ash pits.

Description of the Drawing.

Fig. 1, shows a longitudinal section of a reverberatory furnace suitable for melting iron constructed according to my invention.

Fig. 2, shows a plan in section of the furnace, and I would state in regard to other reverberatory furnaces and also other furnaces, that they are to be constructed in a similar manner to that shown by figs. 1 and 2, so far as the heating and introducing air into the ash pits are concerned.

The letters, A, A, A, A, mark the course of a flue or air channel conducting atmospheric air along the heated surfaces of the furnace to the fire grate below the fire bars, which may be varied in form and direction, and will in fact require to be varied to suit constructions of furnaces differing from that shown; B, B, B, are thick plates of cast iron forming the two sides and back of the ash pit, with perforations for the passage of the heated air from the flues marked A, to the ash pit.

Fig. 1, shows the perforations in the side plates, B, graduated as I prefer them to be; C, is a cast-iron plate forming the inner side of that part of the flue, A, which traverses the back of the ash pit. The perforations in the plate, B, forming the back of the ash pit, are small and few in number, and intended chiefly for the purpose of inducing a sufficient circulation through that portion of the flue, A; D, is the ash pit closed by folding doors and a flap as described; E, is the mouth of the air flue, A_2, to which a

slide may be conveniently adapted to regulate the admission of air. By means of this flue, A, the air entering at E traverses the heated sides and bottom of the furnace, and becoming highly heated enters the ash pit through the perforations in the cast-iron plates, B, B, B.

Having thus described the nature of my invention, and the manner in which the same may be performed, I would have it understood that what I claim is, the mode of constructing reverberatory and other furnaces whereby air under atmospheric pressure only is caused by means of suitable flues or passages to traverse more or less of the heated surfaces of the furnace and to pass through suitable openings into a closed ash pit.—In witness, &c.

GEORGE DALTON.

Specification of the Patent granted to JAMES SHIELD NORTON *and* HENRY JULES BORIE, *of Union Works, New Park-street, Southwark, Engineers and Ironfounders, for Improvements in the Manufacture of Tiles and Stairs from Plastic Materials.*—Dated July 20, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of making each tile and stair hollow, or with hollow channels through them, by which great strength and lightness will be obtained, and the same will admit of being better burned or fired. For this purpose, plastic materials are to be forced through dies of the forms suitable to produce the external contour of the tiles or stairs, and in such dies, cores are placed to produce the hollow channels.

Having thus stated the nature of our said invention, we will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, represents a perspective view of a hollow or tubular tile, constructed according to our invention, with gutters at the sides, and the nail hole for securing them to the lath, in the same manner as slates or plain tiles.

Fig. 2, is a perspective view of a similar tile reversed, showing a knib or projection for retaining the tile on the lath or stay.

Fig. 3, represents a perspective view of two similar tiles, having ribs instead of gutters; the ribs and joint being covered with semicircular and conically-formed joint covers, as shown.

Fig. 4, shows a plan of a die or mould, having openings or moulding orifices suitable for forming two tiles according to our invention, by having clay or other plastic material forced through such openings, as is well understood in the manufacture of like articles from plastic materials.

Fig. 5, shows a longitudinal section; and

Fig. 6, a transverse section of the same die or mould,

Figs. 7 and 8, show longitudinal and transverse sections of a mould and apparatus suitable for making hollow or tubular tiles according to our invention, by forcing the clay or other plastic material into such moulds.

Fig. 9, shows a longitudinal section; and

Fig. 10, an end view in perspective of a tile closed at one end.

Fig. 11, is a perspective view of part of a flight of hollow stairs or steps; and

Fig. 12, shows part of a flight of another form of hollow stairs or steps made according to our invention.

Fig. 13, shows a section of an apparatus suitable for moulding a hollow stair or step according to our invention, by having the clay or other suitable plastic material forced into a mould, as hereinafter described.

Fig. 14, shows a plan of several forms of tiles constructed according to our invention.

We will now proceed to describe how hollow or tubular tiles and stairs may be made according to our invention.

One process consists of expressing or forcing clay or plastic material through dies having moulding orifices and cores similar to those employed in the manufacture of hollow bricks and other similar articles, as is well understood.

Figs. 4, 5, and 6, show a die with two moulding orifices of the form of the tile intended to be produced. *c*, *c*, are the cores supported within the moulding orifice, by means of the bridge, B, B; the die may be adapted to any machine or apparatus suitable for forcing the plastic material through the moulding orifices; the tiles are received on to rollers, and cut to the proper length, as is well understood in making tiles and similar articles.

Another mode of forming hollow tiles according to our invention consists in employing a mould, *m*, *m*.

Figs. 7 and 8, made in two parts hinged together, th inner surfaces of which are of the exact size and form of a tile. A minor series of cores, *n*, are fixed at one of their extremities to a block or slide, *o*, which slides on a bed plate, P, by which the cores are introduced at one end between the plates, *m*, *m*, which form the mould, and the other ends of the cores are supported on a cross-piece, *r*, within the chamber, H, so as to be quite firm, and the slide, *o*, is then to be fixed with the core or cores in that position. The plastic material contained in the box or cylinder, H, is then to be forced by the piston, A, from the chamber, H, into the mould, so as to form a tile; the mould is then moved a short distance from the chamber, H, and the tile is cut off by a wire, as is well understood; the cores are then pulled back by the handle, S, the box is opened by moving the upper plate on the hinge, T, and the tile may be taken out. In this arrangement, if the cores are a little shorter than the mould, one end of the tile will be solid or closed up, and the pin, which is used to secure the end of each core, will leave small openings, as shown in figs. 9 and 10.

Another mode of closing the tube consists of merely pressing the end of the tile with a piece of wood, so as to compress and unite the plastic material.

To support the tile on the laths or boarding of roofs, one mode consists of making a hole through the tile, as shown in fig. 1.

Another mode consists in forming the die or mould, fig. 4, with a small recess, *x*, which will form a rib on the tile, which rib may be afterwards cut away, except near the extremity, as at *y*, fig. 2, which will form a nib to retain the tile upon the lath or roof to which it is applied.

The modes of manufacturing hollow stairs or steps being similar to the arrangements described for making hollow tiles, it will not be necessary to give a minute description thereof. One mode consists of employing a die or mould having suitable orifices and cores, through which the clay or plastic material is forced; and this process being well understood, we have not thought it necessary to describe it with drawings.

Fig. 13, shows apparatus suitable for moulding a stair or step according to our invention. A, A, is one or, it may be, several upright cores, which are secured in the two parts of the mould, M, M, so as to leave around them space for the plastic material, which is forced into the mould by a piston,

1*. When the space is filled up, the cores are drawn out and the box opened by means of the two levers or arms on each side of the mould.

Various plans have been resorted to with a view to regulate the temperature of rooms next the roof, and great advantage will be obtained by employing tiles of cellular formation for this purpose, made according to our invention, with one or both extremities closed. The hollow tiles when closed will act as non-conductors of cold in winter, and of heat in summer; and by using those with the tubes left open, they will be found efficient ventilators, by admitting the air in the safest manner through the tubes running upwards in the direction of the roof, as shown in figs. 1, 2, and 3.

The tubular configuration gives great strength with a less body of material, and thus a strong and lighter covering is produced, at the same time less liable to leakage, for should the outer plate get fractured, the wet would be carried off by the chamber below. The tubular steps or stairs have many advantages in common with the tiles; being lighter, they may be used in positions where blocks of stone would be too heavy, and in many countries stone is very expensive; being made of material not fusible, they are fireproof, very strong, and inexpensive.

We would remark, that the plastic materials we employ for the manufacture of hollow or tubular tiles and stairs, according to our invention, are clay or brick earth, or other plastic materials capable of being moulded to form, and requiring to be fired or burned, and also compounds capable of being moulded when in a plastic state, and which will afterwards set and get hard without burning.

Having thus described the nature of our invention, and the manner of performing the same, we would have it understood that what we claim is,

First, the making of tiles for roofs from plastic materials, each tile having several openings or passages through it, as herein described; and

Secondly, we claim the making of hollow stairs from plastic material, as herein described.—In witness, &c.

JAMES SHIELD NORTON.
HENRY JULES BORIE.

Specification of the Patent granted to JOHN SMEDLEY, *of Lea Mills, Matlock, in the County of Derby, Spinner, for Improvements in Machinery or Apparatus for Opening, Cleaning, Blowing, or Scutching Animal Wool, Cotton, or other Fibrous Substances or Materials.*—Dated April 1, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention relates to improvements in the construction of the beaters of the blowing machine; and, instead of open beaters, as now generally used, I use a drum or cylinder with blades or projecting knives on the surface of it, so that during its revolutions or revolving motion the said blades or knives strike the cotton or material to be opened, instead of the projecting blades on the arms of the beaters of the present machines. This alteration or modification of the blowing machine, although simple in appearance, will be found in practice to be very efficient, and will be easily understood by reference to the accompanying sheet of drawings, in which the same letters of reference are used to represent similar parts, where different views or diagrams are shown.

Fig. 1, is a front view of the drum or cylinder, showing the blades or knives on the surface; and, though placed in a perpendicular or vertical position on the drawing, it revolves horizontally in the machine; and

Fig. 2, is a plan of the same. *a*, represents the axles of the drum or cylinder; and *b*, the blades or knives on its surface.

Having thus described the nature and particulars of my said invention, I desire it to be distinctly understood that I do not confine myself to any precise number of blades or knives on the surface of the drum or cylinder, nor to any particular size or dimensions thereof.

But I claim as of my invention, and which, to the best of my knowledge and belief, has not been hitherto used within this realm, the use of a drum or cylinder with projecting blades or knives for the blowing machine, as herein described and illustrated in the accompanying sheet of drawings.—In witness, &c.

JOHN SMEDLEY.

Specification of a Patent granted to JULIAN BERNARD, *of Guilford-street, Russell-square, in the County of Middlesex, Gentleman, for Improvements in Casting Metals, and in Moulding or Forming other Materials.*—Dated April 25, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My said invention relates to an improved system or mode of casting metals or moulding plastic materials of any kind, whereby a much greater degree of sharpness and accuracy is obtained in the articles so formed. It consists of casting, moulding, or shaping metals and a variety of other substances, while in a liquid or plastic state; such as iron, copper, brass, gutta percha, caoutchouc, and their compounds, porcelain, and earthenware of all kinds; such casting or moulding being effected in a partial vacuum obtained by extracting the atmosphere from the moulds or shapes in which the metal or other materials are to be cast or moulded. When plastic or soluble materials are to be shaped they may, if found desirable, be pressed or forced into the exhausted mould by any convenient means.

When metals are cast according to this process, the pots, ladles, or crucibles containing the metals may have a hole in the bottom part plugged by a fire-brick or plug of any other suitable material, and the pot placed over a channel or aperture communicating with or entering into the mould, the communication being made air-tight by surrounding the bottom of the pot with loam or other suitable material. The moulds or shapes used in this process may be kept at any desired temperature by the application of steam or heated air, or cold water or air.

Fig. 1, on the accompanying sheet of drawings, represents a moulding box and mould for a steam-engine cylinder in vertical section; and

Fig. 2, is a vertical section of the crucible or ladle of molten metal, showing the mode of supporting it, and of running the metal into the mould; and

Fig. 3, represents a vertical section of a mould for plastic material. A, B (fig. 1), are the moulding boxes joined together by bolts at the flanges, C; one of these boxes may be made with the bottom cast on as at A, whilst the other one, B, is made in the ordinary manner, namely, open through-

out, but is fitted with extra flanges at D, to receive the cover or plate, E. Both boxes may be constructed with supporting bars, if their dimensions render such arrangement necessary. The mould is prepared in the ordinary manner, and the boxes, A and B, are securely bolted to each other by the bolts at C, C, in order to form an air-tight joint. The plate, E, is then put in its place, and bolted tightly up, so as to exclude as much as possible the external atmosphere from the interior of the mould, G. The crucible or ladle, H, containing the metal, is supported on the fire-brick, I, which is composed of two pieces, being divided longitudinally down the centre of the channel or passage, J. Beneath the crucible or ladle and the supporting fire-brick is fitted a bed of loam, K, upon which the ladle rests, thereby completely excluding the atmosphere from the channel, J, and from the interior of the mould. A plug of fire-clay, L, is fitted into the aperture at the bottom of the crucible or ladle, and is kept in its place by the superincumbent pressure of the metal. A cock, M, communicating with the interior of the mould, is temporarily fitted into the upper portion of the moulding boxes, and is connected by any suitable flexible tubing with an air-pump or other exhauster. The ladle having been fitted into its place on the fire-brick, I, the air is exhausted from the interior of the mould by the exhaustion before mentioned; and when a sufficient vacuum is obtained, the cock, M, is shut, and the plug, L, in the ladle withdrawn, allowing the metal to be run or forced by atmospheric pressure into the interior of the mould, until it reaches the level of the cup, N, in the upper portion thereof. This aperture is closed, before exhausting, by means of a disc of metal or loam, O, fitted loosely over it; and when the exhaust takes place, the pressure of the atmosphere keeps it pressed down, and prevents the entrance of air to the interior of the mould. Upon the level of the metal reaching this disc it is displaced, and the pressure of the metal in the cup indicates that a sufficient quantity has been run in, when the plug in the ladle is immediately let down by a chain or cord attached to it, and the supply of metal consequently stopped. By this means the metal is prevented from rising high enough to fill the mouth of the cock, M, which would be a source of great inconvenience. When the casting is completed, the ladle is removed, and the supporting brick is divided longitudinally for the purpose of extracting the hard metal left inside. This system

of casting will be found very desirable where a superior surface and sharpness of outline is required, such casting being perfectly free from air-bubbles or impurities of any kind. In moulding plastic materials, the matrices are formed of metal or hardened plastic material, as shown in vertical section at fig. 3. The mould, A, is formed in two parts, fitted with flanges and bolted together at B, to form an air-tight joint. The drawing represents a mould for casting a flower vase, the internal core, C, of which is held in its place by the slightly overlapping conical portion, D, at its upper end, which fits into a corresponding groove in the moulds. An exhausting cock is fitted to the mould at E: and an inlet, F, for the admission of the material, is formed at the bottom of the same mould. Previous to casting, the mould is exhausted as before described, and the lower inlet cock, G, being previously closed; when sufficiently exhausted, the upper exit cock, E, is shut, and the lower one opened, when the material will be pressed into the mould by atmospheric pressure, or, if necessary, it may be forced in by mechanical pressure. The above-described process may be employed when great density and sharpness of outline is required, and for preventing air-bubbles or porosity in a variety of articles formed of plastic materials.

Having now described and particularly ascertained the nature of my said invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion, that I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of my invention.—In witness, &c.

JULIAN BERNARD.

Specification of the Patent granted to AUGUSTE EDOUARD LORADOUX BELLFORD, *of No.* 16, *Castle-street, Holborn, in the County of Middlesex, for Improvements in the Extraction and Manufacture of Sugar and of Saccharine Matters.*—Dated May 2, 1853.—(A communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The new process of extraction of sugar and saccharine

matters which constitute my invention, is applicable to the clarifying of sugar, to the extraction of the juice of the beet root, and of what remains in the pulp of this root after it has been submitted to the action of the press; the beet root and the pulp may be treated either raw, baked, or dried. This process is also applicable to the complete extraction of malt for making beer. For the extraction of sugar and saccharine matters I make use of apparatus represented upon the drawing. These apparatus consist of vessels of a conical form, furnished at their lower part with metallic sheets, and which have at their upper part a tube furnished with a cock; these apparatus differ little from each other.

Purifying and Clarifying of the Sugar.

The sugar charged with molasses is inclosed in the vessel represented fig. 1, which, as I have said, is furnished at its lower part with a metallic sheet fit for retaining the crystals of sugar; at its upper part a forcing pump is attached, or a tube of several yards in height, furnished with a cock, for the purpose of bringing upon the mass of sugar a column of clarifying matter, which, by the pressure which it exercises, expels the molasses, and substitutes itself for it without mixing with it. If it is then desired to clear away the sugar from the clarifying matter with which it is impregnated, the latter is removed in its turn by forcing air from above; it thus runs out like the molasses from the mass of sugar, which becomes white and drained. By taking away the lid from the vessel, and leaving it to drain for two or three days, the forcing of the air may be dispensed with. In the manufacture of sugar the filling is made directly in the apparatus. The metallic sheet is stopped with a false bottom. When the sugar is dry this false bottom is taken away; then the crust which forms on the surface is scraped and removed; then the vessel is hermetically closed, and the tube or pump is attached.

The apparatus represented fig. 1, consists of a vessel of a conical form, A. This vessel is supported by means of two gudgeons, B, B, so that when one operation is finished, and the sugar is desired to be withdrawn, the moveable cover, C, is taken away, and the vessel has only to be turned upon the gudgeons, B, B. This cover is to be placed upon the vessel when the clarifying matter

is to be agitated. I do not indicate the means for effecting the reunion of the vessel and cover; this may be effected in many ways. At the upper part of the lid is a tube, D, by which the clarifying matter is conveyed. This tube is furnished with a cock, E, which allows of interrupting the passage of the latter when necessary; and at its upper part is a rose, which forces the jet of clarifying matter to spread itself upon the whole surface of the vessel. At the bottom of the vessel, A, is a metallic sheet, F, the meshes of which are sufficiently close to prevent the little crystals of sugar from passing through. This sheet is held upon a hoop with a grating underneath, and placed at the bottom of the vessel, where it is retained by a rim, G, G. Below the metallic sheet is the false bottom, I, which is used when the vessel, A, is filled with syrup, and which is taken away when the clarifying is to be effected; this false bottom may be supported by different means. The metallic sheet may be replaced by a metal plate, pierced with small holes. To extract the juice of the beet root, or what remains yet in the pulp of that root after it has been submitted to the action of the press, as well as for the complete exhaustion of the malt for making beer, I have modified the apparatus already described, as figs. 2 and 3 indicate. The cover of the apparatus represented fig. 2, is not moveable; it is of one piece with the apparatus. The metallic sheet bottom fits outside, and is only used after having introduced into the vessel by the lower part the matter to be treated; this bottom is raised when the materials are to be withdrawn. All these operations may be easily effected by turning the apparatus upon the two gudgeons, B, B, which support it. The apparatus represented fig. 3, has at its upper part an opening of eight to sixteen inches diameter for the introduction of the substances to be treated.

In order that the first separation of the liquid from the solid may be effected more readily, I place in the centre of the apparatus a pipe of perforated metallic sheet, or of metal pierced with small holes; this pipe is retained by a socket soldered upon the metallic sheet; it is of four to eight inches diameter; its height should be about six inches less than that of the apparatus, and it is closed at the upper part by a moveable cover. This pipe is taken away when the apparatus is full. Then the upper opening is closed with a cover, well supported, and the pressure

is made; the cock and the rose indicated in the desc
of the apparatus represented fig. 1, are fixed aft
cover. The metallic bottom is fitted outside, as is st
the description of the apparatus shown in fig. 2.
opening of the apparatus shown fig. 3, is especially
for the brewers who work after the Bavarian method.
are no longer necessary. Those who work in the or
method, by making the steeping in the vats, may alsc
this by making the steeping in the cauldron; and wh
saccharification is ended, all the liquid and solid ma
are brought by means of a gutter into the apparatus,
simplifies the work. In whatever manner it is op
my process affords to brewers a notable economy; an
one steeping being necessary, there is consequer
saving in fuel, and, besides, the beer obtained is of
quality. The pulp of the beet root may be treated in
two apparatus as it issues from the grater or from the
the beet root may also be treated in these two app
cut in slices; but I have observed that the extraction
juice was effected in a much more complete manner
these pulps or slices had been previously softene
plunging them into boiling juice of the beet root, ar
want of juice, for the first operation into boiling
for about fifteen or twenty minutes. The cells inc
the juice, which have not been broken by the grater
root-cutter, are broken, or at least rendered permea
the action of a high temperature to which they have
submitted; moreover, the albuminous parts are coagı
and the juice is purer. Pulp, after having been p
and set aside for the food of cattle, has even then pro
by my process eighty per cent. of its weight in juice.
pulp issuing from the grater or the slices gives
the juices they contain. Beet root, or the dried pulp
not actually require the preliminary operation of
I have just spoken, the desiccation fulfilling the
purpose. The pressure necessary for acting on th
ferent matters to be treated which I have designated
be exercised by means of air or water, compressed
aid of a pump or any other means, or even, as is
more simple, by making a column of air act upon
matters, which flows from a reservoir nine to twelv
above the apparatus.

I claim the process I have described for the extract
saccharine matters, and the application of the app

above described, or of any other similar apparatus, to the clarifying of sugar, and the extraction of saccharine matters contained in beet root, either fresh or dried, as well as the application of the same apparatus to the extraction of malt for the manufacture of beer.—In witness, &c.

AUGUSTE EDOUARD LORADOUX BELLFORD.

Specification of the Patent granted to FREDERICK WILLIAM MOWBRAY, *of Bradford, in the County of York, Engineer, for Improvements in Apparatus used in Preparing and Combing Wool and other Fibrous Materials.*—Dated April 7, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention relates to that class of machines used in preparing and combing wool, where portions of fibre are detached from the feeding means by nipping instruments, and thence taken by a carrying or transferring comb, by which they are successively laid on to the passing combs.

And the improvements consist, first, in the application of a brush or series of brushes, or series of teeth, arranged to force the fibre into the carrying or transferring comb in a curved or straight line, corresponding to that in which the passing comb is travelling, by which the fibre taken from the nipping instruments will be in a position to be more effectually laid on to the passing combs.

And, secondly, my invention relates to the arrangement of the nipping surfaces of the nipping instruments used in such machines, and consists in forming one of such nipping surfaces with two or more ribs, and the other with corresponding grooves lengthwise thereof, in order better to hold the fibre which is being separated.

But that the invention may be fully understood, I will proceed to describe the drawing hereto annexed.

Description of the Drawing.

Fig. 1, shows a side view, in section, of parts of apparatus, with my improvements applied. And I would state, that I have not thought it necessary to show a complete machine, such being according to arrangements for which letters patent have been granted to Messieurs

Lister and Donisthorpe, and now well understood. *a*, *b*, are the upper and lower nippers of the nipping instrument employed to take the wool or other fibrous material from the gill-feeding apparatus; and *c*, is the carrying or transferring comb employed to take the wool or other fibrous material at the proper time from the nipping instrument, and lay it on to passing combs. *d*, are series of points, or it may be a brush, into which the points of the carrying comb enter after taking the fibre from between the nipping instruments, so as to cause the fibre to be better pressed into and more securely held by the teeth of the comb, *c*; and when the fibre is to be fed on to a circle of passing combs, I give to the teeth or brush, *d*, a curved form, as shown by fig. 2, corresponding somewhat to that of the circle of combs on to which the fibre is to be laid by the carrier comb, *c*. The one shown is to a scale of three inches to the foot, and is adapted to a circle of combs of forty-eight inches in diameter. When the fibre is to be laid on to combs passing in a straight line, the form of the teeth or brush, *c*, is straight, as shown by fig. 3.

I would also state that, although I have shown the teeth or brush, *c*, affixed to the nipper, *a*, it is not necessary that it should be so, as it may be independent thereof, so long as such tooth or brush surface is arranged or worked to come into position to act against the fibre taken by the carrying comb, as explained.

The nipping surfaces, a^1, and b^1, of the nipping instruments, *a* and *b*, are arranged according to the second part of the invention. The one surface having two, or it may be more than two ribs, and the other having corresponding grooves, by which I am enabled to take a better hold of the fibre than when only one rib or edge has been employed, as heretofore, to act with a groove on such nipping instrument, to take fibre from gill-feeding apparatus, for the purpose of feeding it on to comb teeth.

Having thus described the nature of my said invention, and the manner in which I carry the same into effect, I would have it understood that I do not confine myself to the precise details shown and described, so long as the peculiar character of either part thereof be retained.

But what I do claim is,—

First, the application of teeth or brush surfaces for the purpose of pressing the wool or other fibre into the carrying or transferring comb, so that such wool or other fibre may

be in a better position to be laid on to the passing combs, as explained.

Secondly, I claim the forming the nipping surfaces of nipping instruments used to take wool or other fibrous materials from gill-feeding apparatus, to be fed on to comb teeth, with two or more rows of ribs and corresponding grooves, as explained.—In witness, &c.

FREDERICK WILLIAM MOWBRAY.

Specification of the Patent granted to JOSHUA FARRAR, *of Marsden, in the County of York, Mill Owner, for Improvements in the Treatment of Flax, Line Grasses, and other Fibrous Substances.*—Dated April 8, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention of improvements in the treatment of flax, line grasses, and other fibrous substances, relates to a mode of facilitating the preparation of flax and other vegetable fibrous substances containing gummy or resinous matters, in order to render them suitable for the operations of drawing and spinning.

In order to separate the fibres in the flax stalk it is usual to steep the plant in water, or otherwise submit it to moisture, for the purpose of dissolving the glutinous matter which binds the fibres together. When the flax or other fibre has been thus acted upon, or suitably treated to dissolve the gluten, I propose to submit it to the action of two or more pairs of rollers, in order to express the gummy matter therefrom; and, in order the more effectually to attain this end, I cause the fibre, which is carried from one pair of rollers to another by an endless band of lattice work, or an inclined guide board, or other analogous contrivance, to be submitted (while so passing from one pair of rollers to the other) to a rinsing process, either by the application of a shower of water (acidulated or otherwise), or by conducting it through a shower or through a bath of water.

The figure in the accompanying drawing is a side elevation of the machine intended to carry out the object of my invention. The flax or other vegetable fibre, after it has

been "retted" or steeped, as aforesaid, is placed up
table, *a*, *a*, and fed between the two rollers, *b*, *b*, i
machine. The water and gummy matters are, by m
the upper roller (which is weighted), expressed out
plant; and the fibres are conducted, by means of th
less chain or apron, *c*, *c*, to a second pair of pressing
d, *d*. During the passage of the fibres from the
b, *b*, to the second pair of rollers, *d*, *d*, the fibres ar
mitted to the action of a shower of water, which is n
fall from the vessel, *e*, *e*, above. In addition to the
from above, I find it advantageous to throw a jet o
on to the plant just before it enters between the p
rollers, as shown at *g*, *g*, *g*. The fibres, being satur
second time, are passed, as aforesaid, between the
set of rollers, *d*, *d*, where a further portion of the
or resinous matters is expressed. From thence th
are conducted, by means of the second endless ch
apron, *c**, *c**, to a third pair of expressing roller
But during their passage to the last pair of roller
the fibres are a second time submitted to the actio
shower of water, as before, from a vessel, *e**, and
g; and the fibres are alternately delivered at the
hand end of the machine in a cleaned state, the gu
resinous parts having been removed by the alternate w
and pressing processes.

If desired, the endless chains, *c*, *c**, may be dis
with, and inclined bands used in place thereof, down
the fibres will be conveyed with facility to the severa
of rollers.

Having now described my invention of improvem
the treatment of flax, line grasses, and other fibrou
stances, I would observe, in conclusion, that altho
have shown and described the best arrangement of
nery with which I am at present acquainted for c
my improvements into effect, I do not mean or int
confine myself rigidly to the precise arrangement o
struction of parts herein shown and described, as th
may doubtless be varied without departing from the
and object of my invention; but that which I conside
new in the above-described improvements, and th
wish to claim as the invention secured to me by
patent as aforesaid, is, treating flax or other
vegetable fibres, for the purpose of removing the gu
resinous parts from the plant, by alternately saturati

fibres with water or other liquid, and submitting the fibres to pressure, so as to express or force out the refuse and useless matters, as above described.—In witness, &c.

JOSHUA FARRAR.

Specification of the Patent granted to GEORGE ALBEMARLE CATOR, *of Selby, in the County of York, Gentleman, for Improvements in Machinery for Preparing Flax, Hemp, and other Vegetable Fibrous Substances for Scutching or other Manufacturing Processes.*—Dated April 16, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention of improvements in machinery for preparing flax, hemp, and other vegetable fibrous substances for scutching or other manufacturing purposes, consists in the arrangement or combination in one machine of several of the mechanical parts or contrivances suitable for performing certain processes in the manufacture of flax or other similar fibrous materials preparatory to the fibres being scutched or otherwise treated. One of the principal features consists in the mode of washing the flax or other fibres when under operation in my machine, by causing jets of water or steam to be thrown upon the flax, both on its upper and lower surfaces, so that the gummy and other extraneous matters may be more easily removed.

In the accompanying sheet of drawings I have shown the manner in which I arrange or combine the machinery, so that the several processes may be carried on consecutively.

Fig. 1, is a side elevation of my machine. A, A, is the framework of the machine; and B, is a feed board affixed at one end for supplying the machine with the flax or other fibrous material, which is fed into the machine after the fibres have been steeped or macerated in the ordinary or any other suitable manner. C, C, are a pair of plain wooden or metal rollers, the upper one of which is weighted or forced down by a strong spring for the purpose of expressing out the water or liquid from the flax or other fibre as it passes between the rollers. By the revolution of these rollers the

flax is carried forward to a second pair of rollers, D, D, where any water or other liquid that may have been absorbed by the flax when passing between the jets, next mentioned, is expressed from it. Between the rollers, C, C, and D, D, are two perforated water or steam-pipes, F, which are so placed that the flax, when passing from the rollers, C, to the rollers, D, passes between them. Jets of water or steam are caused to be thrown both upwards and downwards from these pipes, F, upon the flax or other fibres when so passing, and this operation has the effect of thoroughly cleansing the flax or other fibres on both sides. Passing from the rollers, D, the flax is carried to another pair of rollers, E, which are used for the purpose of thoroughly expressing any remaining liquid from the fibres. From these rollers it is conducted underneath the large steam-cylinder, G', and between this latter and the carrying-rollers, H. The cylinder, G', and also the cylinder, G'', hereafter referred to, are heated by steam, which may be admitted into them through hollow axles, or in any other convenient manner which may be found best adapted for the purpose. The flax is pressed against the surface of the steam-cylinder, G', when passing underneath it by means of a series of plain carrying-rollers, H, H. These carrying-rollers are maintained in their position by ordinary brackets, as shown in the drawing. And as the flax is by means of these rollers, H, H, carried round the steam-cylinders by their revolution, it will become dried, as, after it is brought from underneath the lower cylinder, it passes between both the cylinders, G' and G'', and is carried round the upper side of the cylinder, G'', where the flax is pressed against the upper side by a similar series of carrying-rollers, also mounted in brackets. The flax is conducted from the top side of the upper steam-cylinder, by means of two pairs of carrying-rollers, I, I, and J, J, to a series of fluted or plain rollers, or fluted and plain rollers combined, by the operation of which rollers the woody parts of the flax or other fibres will be broken, previous to being scutched or otherwise treated. When the woody parts of the plant are broken, the flax or other fibre is carried on to a delivery board, and taken away to be scutched or otherwise treated.

The several pairs of rollers, C, D, and E, are shown in the drawing as being weighted or pressed down by ordinary spiral springs, and the rollers of the breaking machine are

pressed down by a weighted lever; but I do not confine myself to these modes of weighting the rollers, inasmuch as any of the known and ordinary means of weighting or pressing them may be made use of as may be found most desirable.

Motion is given to the under rollers, C, D, and E, and the steam-cylinder, G[1], and the breaking-rollers, K, by means of bevil-wheels on the shaft, M, which runs the whole length of the machine, and upon the end of which are placed the driving-pulleys, L. The upper rollers, C, D, and E, and the upper steam-cylinder, G[11], are worked by friction of contact, but if it be found necessary, they can be driven by gearing in the usual way. Motion is given to the series of carrying-rollers, H, H, both upper and lower, and the rollers, I and J, by an endless chain or strap, or gearing, connected to any driving part of the machine.

In the drawing, I have only shown three pairs of expressing-rollers, and one pair of perforated water-pipes, for casting jets of water or steam on the flax or other fibre, two steam or drying-cylinders, and four pairs of breaking-rollers; but I wish it to be distinctly understood that I do not confine myself to this number of rollers, cylinders, or pipes, but that any number or series of them may be used as shall be found most desirable in practice. Neither do I intend to confine myself rigidly to the particular arrangement of parts herein shown and described, nor to the precise mode of carrying the flax round the steam-cylinder, as shown in the drawing, nor to the particular mode of driving the machinery, as the arrangement of the machinery and the mode of driving the same may doubtless be varied, without departing from the nature and object of my improvements.

But that which I consider to be new, and therefore wish to claim as the invention secured to me by letters patent as aforesaid, is the combination in one machine, of the washing, pressing, drying, and breaking processes, or any three of them, which can thereby be carried on simultaneously, the flax or other fibres to be operated upon being conveyed from one part of the machine to the other by mechanical means.

I also claim the use of upward and downward jets of water or steam, which may be made to act simultaneously on the upper and under surfaces of the fibres while in the machine.

I further claim the method herein shown and described, or any mere modification thereof, of drying flax or other vegetable fibres after they have been submitted to a wetting or washing process.—In witness, &c.

GEORGE ALBEMARLE CATOR.

Specification of the Patent granted to FREDERIC NEWTON, *of Fleet-street, in the City of London, Optician, for Improvements in Apparatus to be Employed for Producing Photographic Pictures.*—Dated April 2, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention of improvements in apparatus to be employed for producing photographic pictures relates to an improved arrangement of apparatus for taking photographic pictures without the use of a dark room, the essential feature of the invention consisting in so constructing a camera, and the apparatus to be used therewith, that the surface upon which the picture is to be formed may be subjected to the various treatments necessary to render the surface sensitive, and to develope and, if necessary, fix the picture without the necessity of handling the plate or surface, or introducing the hands into the camera or other part of the apparatus. One method of accomplishing this object consists in suspending the glass plate or other surface over a long slot or aperture made in the bottom of the camera for the purpose of enabling the operator to introduce from below the vessels containing the chemical solutions. For instance, the plate or other surface having been properly coated with collodion, or other suitable material, must be secured in a clip or holder fixed to or suspended from the upper part of the camera. The vessel containing the nitrate of silver is carefully passed up from below through the slot or opening made in the bottom of the camera, and the plate is allowed to remain in the solution a sufficient length of time to be properly coated by the silver solution, after which the vessel is drawn down through the bottom of the camera, and the aperture is carefully closed by a slide to exclude the light. The picture may then be taken in the ordinary way on the sensitive surface, and then the vessel containing the de-

veloping solution must be passed up through the opening in the bottom of the camera in the same manner that the silver solution was; vessels containing water for washing the surface, and also a solution for fixing the picture, are in like manner introduced from below, care being taken to close the opening by means of a slide or other convenient contrivance whenever a change of the vessel is required to be made.

Instead of introducing the vessels from below, and drawing them down out of the camera when done with, the vessels may be suspended under the opening in the bottom of the camera by making them slide into grooves made for the purpose. The plate or other surface being suspended from a clip attached to a moveable rod may then be easily dipped down into the several vessels, which may be placed in turn beneath the camera. The clip holder or other contrivance for holding the glass plate or surface, if made of brass, should be well plated with silver, or strongly gilt, or, if preferred, it may be made of bone or ivory; and being attached to one end of a rod, which passes through a stuffing-box at the top of the camera, the plate may be easily lowered into and raised out of the chemical solutions contained in the troughs situate beneath the camera by merely pushing down the suspending-rod. Instead of placing the troughs or vessels containing the chemical solutions under the camera in turn, and removing them therefrom separately, it will be found convenient in practice to adapt to the underside of the camera a drawer or box, in which all the vessels with the requisite chemical solutions may, if required, be placed.

This arrangement is shown in the accompanying drawing at fig. 1, which is a sectional view of part of a camera constructed according to my improvements. The box, *b*, containing the troughs with the chemical solutions therein, must be made to slide backwards and forwards, like a drawer, in grooves made under or attached to the underside of the camera, *a*, *a*, so that the several vessels may in turn be brought beneath the plate or other surface, which must be slidden down in the manner already described through the opening, *a**, into the troughs or vessels containing the chemical agents. To facilitate this operation, I adapt to the drawer containing the vessels a tail-piece, *b**, on which I mark the distances to which the drawer must be slidden, in order to bring the several solutions beneath the hole, *a**, through which the plate descends. A modification of this

plan may be made by placing the box or drawer, with the troughs or vessels containing the chemical solutions, inside the camera; in which case, when it is required to change from one trough to another, the plate or surface, *f*, must be drawn up out of the body of the camera into a chamber fixed on the top, in order to allow the box containing the troughs to be pushed forward.

This modification is shown in the accompanying drawing at figs. 2 and 3, in which fig. 2 is a longitudinal vertical section of a camera, with this plan of carrying out my improvements adapted thereto. Fig. 3, is an end view thereof. *a*, *a*, *a*, *a*, is the box of the camera; *b*, *b*, the drawer or box containing the solution troughs, *d*, *d*, *d*, and which drawer or box slides in grooves made inside the camera; *c*, *c*, is a chamber secured to the top of the camera above a long slot or opening extending right across the camera. This chamber is supported by side pieces, *c**, and when the camera is not in use, the chamber, *c*, may be removed altogether for the convenience of packing. This chamber, *c*, is provided with a sliding front, *e*, which may be taken out when the plate is required to be placed in or removed from the camera. The glass plate or surface, *f*, on which the picture is to be taken, is secured by a screw in a clip, *g*, attached to the lower end of the rod, *h*, which passes through the stuffing-box, *i*, above. For the purpose of enabling the operator to bring the several troughs or solution vessels with accuracy beneath the plate or surface, *f*, the box, *b*, which contains the vessels, *d*, *d*, is provided with a projecting tail-piece, *b**, on which is marked the several distances to which the box must be moved in order to bring the solution troughs beneath the plate, as described in reference to fig. 1. For the convenience of examining the surface of the plate, *f*, or the development of the picture at any time while in the camera, I have provided the chamber, *c*, *c*, with a yellow glass window, *j*, which is covered up by the shutter, *k*, when not required. Fig. 3*, is a longitudinal vertical section of another modification, in which the chemical solutions are contained in troughs placed in a box, which is suspended from beneath the camera instead of inside. In this instance the box or drawer containing the troughs, *d*, *d*, is not intended to be moved backwards or forwards for the purpose of bringing the several troughs, *d*, under the plate in succession, but is always stationary, and the plate is made moveable backward and forward instead

of the box. To effect this object, the stuffing-box, *i*, through which the suspending-rod, *h*, passes, is fixed in a moveable bar, *l*. This bar is made capable of sliding in guides, *m*, *m*, which are screwed or otherwise firmly fixed on the top of the camera, and are shown detached and upon an enlarged scale in plan at fig. 4, and also in side and end elevation in figs. 5 and 6.

In order that the operator may be able to bring the plate immediately over the several troughs in the box below, certain marks, as shown in the plan view, fig. 4, are made on the guide plates, *m*, *m*; and when an index, marked on the moveable plate, *l*, is brought into coincidence with either of the marks on the fixed guides, the operator will at once know that the plate is above a certain trough; it will then only be necessary to push down the rod, and the plate will be dipped into and be acted on by the solution. In order further to ensure the plate's descent in a line perfectly parallel with the troughs, *d*, *d*, a groove is made all down the rod, *h*; and the end of a screw, *n*, which passes through the collar of the stuffing-box, *i*, enters this groove, and prevents the bar from turning round. I would here observe, that I find it convenient to arrange the apparatus in such a manner that the first trough containing the silver solution should be placed under that part of the camera where the plate or surface, *f*, would stand for a short focus lens or lenses, and the last trough is placed in a position corresponding to the longer focus of another lens or lenses. In order to obtain the proper focus, a piece of ground glass is placed in the clamp, *g*, and the sliding bar, *l*, is moved so as to bring the index point, *q*, on the sliding bar, *l*, coincident with the mark on the fixed guides, *m*, corresponding to the long or short focus, as the case may be; the bar, *l*, is then to be clamped there by means of the clamp screw, *o*, and securely held until the exact focus (that obtained by the index being merely an approximation) has been obtained by the ordinary rack or sliding motion in front, but not shown in the drawing. The bar, *l*, may then be unclamped and moved backwards or forwards, as may be required, but can always be brought back with accuracy to the original spot. In order to enable the operator to examine the development of the picture in the construction of camera just described, an eye-hole may, if required, be made in some convenient part of the camera, and light may be admitted to the interior through a window at the top. This

window must be glazed with glass of a suitable colour, so that the light that is admitted may not affect the picture while under the action of the chemical solutions, and the window should also be provided with a shutter to exclude the light while the picture is being taken; as some operators do not consider these windows (for examining the plate or surface while under operation) are necessary, they may, if preferred, be dispensed with.

It will be understood that a picture upon a surface of any size within the limits of the camera may be taken without the necessity of separate frames, the ground glass being marked, as is now usual, in order to show the extent of view that will appear upon a certain size; and by raising or lowering the rod, *h*, from which the surface is suspended, the relative amount of foreground and sky may be determined, care being taken to restore the rod, *h*, and plate, *f*, to the focussed elevation, and retain the rod, *h*, there by the screw, *n*, when the picture is to be taken.

I have mentioned only the collodion process in the foregoing description, but it will be obvious that the albumen, or others which admit of the employment of rigid surfaces to be dipped into the solutions, may be adopted in conjunction with my improvements; and I would observe that, if thought desirable, such a portion only of the operations may be carried on in the camera as must be effected in the absence of light; it will, therefore, be obvious that the final fixing or other treatment which may be carried on under the action of the light may be carried on in any convenient and ordinary manner.

By means of the arrangement shown in fig. 1, which is a modification of the plan shown in fig. 3, the use of the moveable or sliding-bar, *l*, and its guides, *m*, as shown in fig. 3, may be dispensed with by making the box or drawer, *b*, *b*, which contains the solution troughs, moveable in guides under the camera, *a*, *a*, so that each trough may, in succession, be brought under the plate or surface, *f*, in the manner already explained. It will, of course, be understood that if the troughs are made moveable the necessity for making the plate or picture surface moveable will no longer exist, and, therefore, the suspending-rod is made to pass through a stationary stuffing-box fixed in the top of the camera, as shown in fig. 1. As the drawer or box, *b*, containing the solution troughs or vessels is made moveable instead of the slide, *l*, the tail-piece, *b**, must be marked to indicate

the distance the box, *b*, must be moved to bring the troughs under the plate or surface, *f*.

If lenses of different foci are intended to be employed in the same camera, then a hole or opening corresponding to each focus must be made in the top of the camera for the purpose of receiving the stuffing-box through which the suspending-rod passes.

At figs. 7 and 8, I have shown a modification of the plan shown at figs. 1, 2, and 3. In this instance, however, the solution troughs are detached from the camera, and are contained in a separate box.

Fig. 7, is a longitudinal vertical section of the camera; and

Fig. 8, is a sectional view of the box containing the solution troughs, *d*, *d*. The plate or surface, *f*, is suspended by means of a clip from a rod, as shown in figs. 2 and 3, and is inclosed in a moveable box or chamber, *c*, *c*, (as in figs. 2 and 3,) the rod, *h*, passing through a stuffing-box, *i*, at the top of the moveable chamber, *c*; but instead of this box or chamber, *c*, being placed on the top of the camera, as in figs. 2 and 3, it is introduced either from above, as shown at figs. 2 and 3, or from below, a long slot or opening being made in either case in the camera to allow the box to be introduced. Now, supposing the surface, *f*, has been made sensitive by means of a silver bath, and the moveable chamber, *c*, has been introduced into the camera, as shown at fig. 7, the shutter, *e*, must be drawn up so as to expose the sensitive surface, *f*, to the light from the lens, and when the picture has been taken the shutter, *e*, must be lowered so as to make the chamber quite dark. The chamber may then be removed from the camera, and fixed on the top of the box, *b*, *b*, fig. 8, above a long slot or opening, b^1, made in the lid thereof. The troughs or vessels, *d*, *d*, containing the chemical solutions are then brought successively under the plate or surface, *f*, by pushing forward the tail-piece, b^*, and the bottom of the chamber, *c*, being opened by the withdrawal of a sliding-piece, *p*, fig. 7, the plate may be moved down into the solutions by means of the sliding-rod, *h*, as in the other cases.

In figure 8, I have also shown another improvement whereby the necessity of carrying separate bottles for the solutions is avoided. Each of the troughs is provided with a stopper, *s*, *s*, made of wood, covered with a thick piece

of vulcanized caoutchouc or other suitable elastic substance, and these stoppers are kept in their places by the lid of the box, which securely holds them down, and prevents the solution from slopping about. It is evident that the same arrangement for stopping the troughs may be adapted to the other plans above described, in which the box or drawer containing the troughs is adapted to the camera, and by this means much room is economized in the camera, and the weight of the apparatus complete for working is thereby very materially diminished.

I would here remark, that I have not thought it necessary to enter into any explanation of the process of obtaining photographic pictures, nor have I mentioned the chemical agents that are intended to be employed, as I do not propose to make any material alteration therein, but merely to operate in any of the well-known manners that have hitherto been found suitable when dipping troughs are used.

Having now described my improvements in apparatus to be employed in producing photographic pictures, I would observe, in conclusion, that in order to avoid unnecessary detail, and a too lengthy description of trifling modifications, I have only described those arrangements or constructions of parts which have, from experience, been found to answer the intended purpose in the best and most satisfactory manner. I do not, therefore, mean or intend to confine myself rigidly thereto, as I am aware that the construction and arrangement of the various parts may be varied, without departing from the nature and object of my improvements; but that which I consider to be new, and therefore wish to claim as the invention secured to me by letters patent, is, the general arrangement or construction of photographic cameras as above described, or any mere modification thereof, whereby the plate or surface on which the picture is intended to be produced may be subjected to the operation of the chemical solutions or agents in the camera itself, or in another apparatus or box, which may or may not be connected with or attached to the camera; the essential feature of novelty being, that the various operations of dipping or introducing the plate or surface into the solutions or chemical agents, or withdrawing it therefrom, may be effected without handling the plate or surface itself, or introducing the hands into the camera.

I claim, particularly, suspending the plate or surface in any convenient manner from a rod, which is capable of moving up and down in a stuffing-box, or through a hole or aperture made in the camera, so that the plate or surface may be lowered into and raised out of the troughs, *d*, or vessels containing the chemical agents, without handling the same.

I also claim placing the troughs or vessels containing the chemical agents in a box or drawer, which may either be placed inside the camera or made to run in grooves on or attached to the underside of the camera, or used detached therefrom, as above described.

I further claim the method herein shown and described, or any mere modification thereof, for stopping the troughs, *d*, *d*, so as to dispense with the use of separate bottles or vessels to carry the chemical solutions.—In witness, &c.

FREDERIC NEWTON.

Specification of the Patent granted to WILLIAM GOSSAGE, *of Widnes, in the County of Lancaster, Manufacturing Chemist, for Improvements in Obtaining Certain Saline Compounds from Solutions containing such Compounds.*—**Dated June 15, 1853.**

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention of "Improvements in Obtaining certain Saline Compounds from Solutions containing such Compounds" consists of certain improved means which I use for obtaining saline compounds from solutions containing carbonate of soda and other compounds of soda, such as are present in soda liquors obtained by the lixiviation of soda ash or of rough soda (commonly called "black ash") with water. Also for obtaining a saline compound or saline compounds from solutions containing sulphate of soda, either alone or in mixture with common salt.

In the manufacture of alkali produced from common salt (as this manufacture is usually conducted) soda liquors obtained by the lixiviation of "soda ash," or of "black ash," are concentrated by evaporation in iron pans, so as to cause salts to be deposited from such liquors, and the salts so deposited with the mother liquors remaining are removed

at intervals from the evaporating pans. The requisite heat is communicated to the liquors in the pans, either by conducting flame and heated air over the surface of the liquors, or under the bottoms of the pans. When heat is applied to the bottoms of the pans these are exposed to injury in consequence of salts (accumulated thereon) preventing the transmission of heat to the liquors. My improvements consist of certain arrangements of pans and apparatus, and methods of working with the same, by means of which I provide for the deposition of salts from the liquors hereinbefore mentioned, being effected in pans to which no heat is applied, in place of such deposition being allowed to occur in the pans to which the requisite heat is applied.

My improvements also comprise the use of streams of air passing through such solutions. Sheet 1, of the drawings hereunto annexed, exhibits two iron pans suitably arranged for my improved method of working.

Fig. 1, is a vertical section of the arrangement.

Fig. 2, a plan view of the same; and

Fig. 3, a separate view of one portion of the apparatus. In these several figures the same letters of reference are used to indicate the same parts. A, is a pan containing liquor from which saline compounds are to be obtained. Heat is applied to the bottom of this pan, either by special fires adapted thereto, or by waste heat conducted from furnaces. B, is a pan to which no fire heat is applied. This pan also contains liquor of the same kind as contained in the pan, A. C, is a channel of communication from A to B. D, is a channel of communication from B to A. E, is a paddle wheel, which being caused to revolve by suitable mechanical means occasions the liquor contained in the two pans, A and B, to circulate in the direction shown by arrows. F, is a vessel by means of which streams or bubbles of air are caused to ascend through the liquor contained in the pan, B. This vessel is supported about three inches above the bottom of the pan, B. It has a series of notches, G, G, cut in its lower edge on each side of the vessel (as shown in fig. 3.) through which streams of air pass into the liquor. A supply of atmospherical air is obtained by means of a forcing pump (driven by suitable means), which is connected with the vessel, F, by the pipe, H. I, is a cock communicating from a reservoir (containing suitable liquor) for supplying the same to the pan, A. In commencing to work with this apparatus I apply heat to the pan, A, until the liquor

contained therein has acquired such degrees of concentration and of temperature that it will deposit salts, upon its temperature becoming reduced only a few degrees. I then cause the paddle-wheel, E, to revolve in the proper direction, which occasions liquor to be withdrawn from the pan, B to A, and at the same time a corresponding volume of hot concentrated liquor is caused to flow from A to B. This hot concentrated liquor becoming cooled in the pan, B, deposits a portion of the salts it previously held in solution, and the cooled liquor flows from B into A, wherein it becomes again heated and concentrated by evaporation, and again flows into B, to deposit a further portion of salts. This circulation being kept up by the revolution of the paddle-wheel, I accelerate the cooling of the liquor in the pan, B, and at the same time occasion a further evaporation of water therefrom by injecting streams of air through the liquor in the pan, B, by means of the air pump connected with the vessel, F. I regulate the speed of the paddle-wheel, E, and the supply of fresh liquor through the cock, I, in such manner that the hot concentrated liquor flowing from the pan, A, shall not be sufficiently strong to deposit salts at the temperature of the liquor in such pan, but shall be in a condition to deposit salts on being slightly cooled. I remove the salts deposited in the pan, B, at intervals.

Sheet 2 of the drawings hereunto annexed exhibits a plan view of a series of iron pans and apparatus arranged suitably for working according to my improvements. These pans are all placed on the same level. A, A, are two pans to which heat is applied by special fires or by waste heat from furnaces. These pans communicate with each other by a channel, *a*, and are connected with a cooling pan, B^1, by means of a channel, C. The pan, B^1, is connected with a heating pan, E, through the channel, D, and the pan, E, is connected with the cooling pan, B^2, by the channel, *e*. The cooling pan, B^2, is connected through the channel, G, with the heating pan, J, and this is connected through the channel, *h*, with the cooling pan, B^3, which is connected through the channel, K, with the heating pan, L. This pan, L, communicates through the channel, *i*, with the cooling pan, B^4, and this cooling pan communicates through the channel, *m*, with the heating pan, N, which communicates through the channel, *n*, with the cooling pan, B^5, from which liquors are allowed to flow through a channel, P. Each of the

cooling pans, B[1], B[2], &c., is provided with a vessel, F[1], F[2], &c., for distributing streams or bubbles of air through the liquor contained therein. These vessels, F[1], F[2], &c., are of the same construction and have the same adaptation as the air-distributing vessel shown on Sheet 1, of the drawings hereunto annexed, and which have been hereinbefore described. They are connected with an air pump by means of the pipes, H[1], H[2], &c. I[1], I[2], &c., are cocks communicating with a reservoir containing suitable liquor, through which a supply of liquor can be conveyed to the heating pans. Heat is applied to each of the heating pans by means of special fires adapted thereto, or by means of waste heat conducted from furnaces. In commencing to work with this set of apparatus (all the pans having been supplied with liquors from which I wish to obtain saline compounds) I apply heat to each of the heating pans; and when I find that the liquor contained in the pans, A, A, has acquired such degrees of concentration and of temperature that it will deposit salts when its temperature is reduced only a few degrees, I cause a further supply of liquor to be introduced into the pans, A, A, through the cocks, I, I, which introduction occasions a flow of hot concentrated liquor through the channel, C, into the cooling pan, B[1]; at the same time I cause streams or bubbles of air to be impelled through the liquor in the pan, B[1], so as to accelerate the cooling of the liquor and promote evaporation of water therefrom. Salts become deposited from the liquor in the pan, B[1], and cooled liquor flows therefrom through the channel, D, to the heating pan, E, and, becoming heated and concentrated therein, it flows into the cooling pan, B[2], wherein it is subjected to streams or bubbles of air passing from the vessel, F[2]. The liquor in its passage through the pan, B[2], having become cooled and deposited salts, flows through the channel, G, into the heating pan, J, and becoming heated and concentrated therein, it flows from such pan into the cooling pan, B[3], wherein it is subjected to streams or bubbles of air passing from the vessel, F[3], and, having deposited salts, it flows through the channel, K, into the heating pan, L, and, becoming heated and concentrated therein, it flows from such pan into the cooling pan, B[4], wherein it is subjected to streams or bubbles of air passing from the vessel, F[4], and, having deposited salts therein, it flows through the channel, M, into the heating pan, N, and, becoming heated

and concentrated therein, it flows from such pan into the cooling pan, B^5, wherein it is subjected to streams or bubbles of air passing from the vessel, F^5, and, having deposited salts therein, the remaining liquor flows through the channel, P, into some convenient receptacle.

By means of the cocks, I^1, I^2, &c., I introduce such a supply of fresh liquor into each of the heating pans (when required) that the hot concentrated liquor flowing from such pans shall not be sufficiently strong to deposit salts at the temperature of the liquor in such pans, but shall be in a condition to deposit salts on being slightly cooled. In the Specification of my invention of "Improvements in the Manufacture of Alkali from Common Salt," for which I obtained letters patent, bearing date on or about the eighteenth day of May, in the present year, I have described certain processes or operations in which different saline compounds of soda contained in "black ash liquors" become separated from each other. The arrangement of a series of pans and apparatus I have hereinbefore described (and which is exhibited on Sheet 2 of the drawings hereunto annexed) is suited for effecting the separation of different saline compounds of soda contained in such liquors. In employing such a series of pans and apparatus for obtaining different saline compounds of soda from "black ash liquors" (previously deprived of sulphuret of iron) containing carbonate of soda, caustic soda, and ferro-cyanide of sodium, I find that the salts deposited in the cooling pan, B^1, consist almost entirely of carbonate of soda, and such salts, after being drained and subjected to a slight filtration of water or of solution of carbonate of soda through the same, will yield soda ash of good quality. I find also that salts deposited in the cooling pan, B^2, although consisting, for the most part, of carbonate of soda, contain a notable proportion of caustic soda and of ferro-cyanide of sodium. I transfer these salts to the cooling pan, B^1, wherein the salts become deprived of nearly all the caustic soda and ferro-cyanide of sodium previously mixed therewith. I find also that the salts produced in each succeeding cooling pan become more and more impregnated with caustic soda and ferro-cyanide of sodium, and I transfer the salts produced in the pan, B^5, to the pan, B^4, and from the pan, B^4, to the pan, B^3, and so on.

The salts are thus transferred through the different cooling pans in succession till they arrive at the cooling

pan, B^1, from whence they are transferred with the salts produced in such pan, and by slight washing are rendered suitable for the production of good soda ash. Caustic soda and ferro-cyanide of sodium (previously contained in the liquor employed) become thus concentrated in the liquors flowing from the cooling pan, B^5; and these liquors are subjected to the processes or operations for separating such compounds therefrom which are described in the Specification of my said patent. When I employ my improvements for obtaining sulphate of soda and common salt separately from solutions containing such saline compounds of soda, I find that the deposition of each salt separately is affected by the relative proportion of the salts present in solution, also by the temperature of the solution at which the deposition of salt takes place. Thus, when I am operating on solution containing three parts of sulphate of soda for each one part of common salt I find that the salts deposited in the cooling pan consist almost entirely of sulphate of soda; but when the solution contains nearly equal proportions of sulphate of soda and common salt, and the temperature of the solution in the cooling pan is reduced by streams of air or otherwise to about ninety-two degrees of Fahrenheit's thermometer, the greater part of the deposit consists of common salt, and the solution or mother liquors remaining after such deposition being concentrated by passing through a heating pan, and its temperature subsequently reduced, by streams of air or otherwise, to about eighty degrees of Fahrenheit's thermometer, the greater part of the salts deposited consists of sulphate of soda. By this mode of working, sulphate of soda can be obtained from solutions (containing also common salt) of sufficient purity to be suitable for the manufacture of alkali.

I have hereinbefore described and fully explained certain means by which I prefer to carry into effect my invention of "Improvements in Obtaining certain Saline Compounds from Solutions containing such Compounds," but I do not confine myself to the employment of the exact means herein described, as these may be varied to some extent without deviating from the nature of my invention. I claim as my invention an arrangement of apparatus for obtaining saline compounds of soda from solutions produced by the lixiviation of "soda ash" or "black ash;" also, sulphate of soda from solutions containing such compound of soda; which arrangement of apparatus provides for such compounds

being deposited from hot saturated solutions containing the same by cooling such solutions in a pan or vessel, which pan or vessel is so connected with the pan or pans employed for heating and concentrating such solutions that a continuous flow of such solutions can be maintained through the same.

I further claim the passing of streams of air through such hot solutions contained in such cooling pans or vessels for the purpose of cooling the same, and causing evaporation of water therefrom.—In witness, &c.

WILLIAM GOSSAGE.

Specification of the Patent granted to CHARLES AUGUSTUS PRELLER, *of Abchurch-lane, in the City of London, Merchant,* JOHN EASTWOOD, *of Bradford, in the County of York, Wool Comber, and* SAMUEL GAMBLE, *of Bradford aforesaid, Machine Maker, for Improvements in Machinery for Combing, Drawing, or Preparing Wool, Cotton, Silk, Hair, and other fibrous materials.*—Sealed September 16, 1852.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our invention consists of an improved mode or modes of, or improved machinery for, successively taking off or combing, and afterwards successively clearing and straightening, and then successively depositing on suitable combs small quantities of wool, cotton, silk, hair, and other fibrous materials. Firstly, by means of an improved instrument or apparatus for carrying a working or transmitting comb or combs, and which is so constructed and set in motion as (when moving in one direction) to cause the said comb or combs to take (from any suitable feeding apparatus) successively separate portions or small quantities, and to pass them successively against card or other suitable clearing surfaces, and then so as to carry them successively past or beyond any suitable receiving-combs, that the said portions may pass quite freely, or so as not to touch the said receiving-combs, and then (on the movement of the said instrument or apparatus being reversed) to carry the said portions successively so close to the said receiving-combs as to deposit them successively upon the said receiving-combs.

Secondly, by means of an instrument or apparatus for carrying a working or transmitting comb or combs, which, when moving in one direction, causes it or them to take (from any suitable feeding apparatus) successively separate portions of the material, and to pass them successively against card or other suitable clearing surfaces, and then successively to carry them towards receiving combs so constructed (when in action), first to recede, and consequently to allow the working or transmitting comb or combs to pass quite freely, and afterwards (on the movement of the said instrument or apparatus being reversed) to advance, so as to allow the said working or transmitting comb or combs to approach so near to the said receiving combs, as that it or they may deposit the said portions upon the said receiving combs.

Thirdly, by means of an instrument or apparatus for carrying a working or transmitting comb or combs, and which (when in motion) causes it or them to take from any suitable feeding apparatus successively separate portions, and to pass them successively against card or other suitable clearing surfaces, and then successively to deliver the said portions to or upon an intermediate carrying or transferring comb (or combs), which conveys them from the working or transmitting comb or combs towards and to, and delivers them upon, any suitable receiving combs.

Our invention also includes certain specific parts of the above machinery or apparatus, and consists of an improved mode or modes of, or improved machinery for, successively taking and then successively depositing on suitable combs small quantities of wool, cotton, silk, hair, and other fibrous materials by means,

Fourthly, of an improved instrument or apparatus for carrying a working or transmitting comb or combs, which is so constructed as (when moving in one direction) to cause the said comb or combs to take (from any suitable feeding apparatus) successively separate portions or small quantities, and then so to carry them successively past or beyond any suitable receiving combs that the said portions may pass quite freely, or so as not to touch the said receiving combs, and then (on the movement of the said instrument or apparatus being reversed) to carry the said portions successively so close to the said receiving combs as to deposit them successively upon the said receiving combs; and,

Fifthly, of an instrument or apparatus for carrying a

working or transmitting comb or combs, which, when moving in one direction, causes it or them to take (from any suitable feeding apparatus) successively separate portions of the material, and then successively to carry them towards receiving combs, so constructed as (when in action) first to recede, and consequently to allow the working comb or combs to pass quite freely, and afterwards (on the movement of the said lever or apparatus being reversed) to advance so as to allow the said working or transmitting comb or combs to approach so near to the said receiving combs as that it or they may deposit the said portions upon the said receiving combs.

And having thus described the nature of our said invention, I will proceed to describe the manner in which the same may be best performed, by the following statement and detailed description of the drawings, which are made to a scale of about one-fourth of the actual dimensions.

With reference to our first improvement in the drawing No. 1, figs. 1 and 2 are elevations of opposite sides of a single machine or apparatus (fig. 1 being shown partly in section).

In drawing No. 2, fig. 3, is an elevation corresponding with fig. 1 of the framing, and of some parts of the machine which are not distinctly represented in that figure.

Fig. 4, is a transverse section taken through the line, z, z, in fig. 2, showing a side view of the receiving chain or travelling combs, with the chains and wheels which carry them.

In the drawing No. 3, fig. 5, is a plan view of the machine.

In the drawing No. 4, figs. 6, 7, and 8, are side views of an improved instrument or apparatus for carrying the working or transmitting comb or combs, representing it in three several different positions, explanatory of the compound motion to which it is subject, and also showing a feeding apparatus and card rollers, and rollers for stripping them.

In the figures 1, 2, 3, 4, and 5, A, is the driving shaft, carrying the pinion, A*, which gears with the wheel, B, on the shaft, B*; C, is a tappit or cam fixed on this shaft, which bears against the periphery of the circular disc or roller, D, which is mounted on an axis in the lever, E. This lever works on an axis at its end, E*, and its opposite end is jointed to the lower end of the vertical connecting-rod, F, which by the raising and lowering of the lever, E,

and by means of the pin, F*, (see fig. 5,) communicates an alternate vibrating or rocking motion to the tappit or cam, G, to which the upper end is jointed. The cam, G, is mounted on the shaft, H, on which it turns loosely; K, is a crank keyed upon the shaft, B*, which by means of the connecting rod, L, gives an alternate motion to the lever, M. The upper end of this lever is formed with a toothed sector, M*, and gears with the wheel, N, which is fixed on the shaft, H, before mentioned, to which, consequently, an alternate vibratory or rocking motion is communicated. The improved instrument or apparatus hereinbefore mentioned is also fixed to the said shaft, rocking backwards and forwards with it. And I prefer to make this instrument or apparatus in the form of a rocking or balance lever, as shown in the drawings, by the part marked O; one end of this lever is moveable, consisting of or being formed with a slide, P, the outer end of which holds the working or transmitting comb, Q; O*, is a counterbalance weight on the opposite end of the lever, O, carrying a bar, O^3, for laying or smoothing the wool throughout its entire width as it is fed into the machine; R, R, are rollers turning on studs fixed on the slide, P, which bear against the turned up-rim or flange of the cam, G. The peculiar form of this cam regulates the action of the slide, P, the inward or return motion of which is assisted by the spring, O^3; S and S*, are cylinders covered with suitable card filleting for removing the short fibres, knots, and other impurities from the wool, or other material under operation, and for opening out and straightening its fibres and laying them parallel, each of the said cylinders being furnished with a series of stripping rollers, T and T*, for clearing them, (as shown most distinctly in the figures 6, 7, and 8,) but instead of the card cylinders, S and S*, any other suitable clearing surface or apparatus may be employed. The smaller cylinder, S, is driven from the shaft, B*, by means of the pinion, U, and the intermediate wheels and pinions marked V, V^*, V^2, V^3, V^4, V^5, the last of which train is keyed on the shaft which carries the said cylinder. This cylinder from the opposite end of its axis, (see fig. 5,) communicates motion to the larger cylinder, S*, by means of the wheel, W, fixed to the cylinder, S, the intermediate wheel, W^*, (not shown in this figure,) and the wheel, W^2, fixed to the cylinder, S*, (see also figs. 1, 3, and 5,) but it is to be observed that the W train of wheels are only shown by their pitch lines, represented by

the dotted circles in the figure 1. The wheels, w and w^2, drive the stripping rollers, r and r^*, of their respective card cylinders by means of pinions, w^3 and w^4. The wheel, r^1, (see fig. 2,) also actuates the train of wheels marked x, x^*, x^1, the last of which is keyed on the axis of one of the pair of feeding rollers marked y, and from this axis motion is also communicated by the train of wheels, y^*, y^2, y^3, on the opposite side of the machine to the pair of feeding rollers marked z, one of them being on the same axis with the last wheel of this turn. Instead of the feeding rollers, y and z, any other suitable feeding apparatus may be employed; z^*, is a bridge or bar, over which the wool or other material is passed as it is fed by the rollers, z and y, into the machine.

In figs. 2, 4, and 5, *a*, is a bevel pinion upon the shaft, b^*, which gears with the bevel pinion, a^*, and thence transmits motion by means of its axis and the additional bevel gearing, *b*, b^*, and the worm gearing, *c*, c^*, and the spur pinion, *d*, to the wheel, *e*, fixed to the former of the two wheels, *f*, f^*, which carry the receiving combs, *g*, *g*, *g*, upon the links of an endless chain, *g*, the joints of the said chain being furnished with studs or pins, which rest in notches formed for their reception in the said wheels, *f*, f^*. The spindle of the worm, *c*, also actuates the bevel and worm gearing, *h*, h^*, h^2, h^3, h^4, h^5, which drives the rollers, *i*, *i*. These are for the purpose of drawing a continuous sliver from the combs, *g*, *g*, as ordinarily practised; and *k*, *k*, are likewise ordinary drawing rollers working at a different speed, for receiving the sliver from the rollers, *i*, *i*, and passing it into a can. These latter, *k*, *k*, are driven by the wheel, h^6, which is actuated by the worm, h^4.

The action of the principal working parts of the machine is as follows, that of the remainder being sufficiently elucidated by the foregoing description. The wool or other material, as it is fed into the machine over the bridge or bar, z^*, is subjected to the action of the working or transmitting comb, q, which takes up a portion, as shown by the figure 6, and passes it over the surface of the card cylinders, s^* and s. These open out, clear, and straighten the fibres, and lay them parallel without breakage or injury to the staple. After leaving the card surfaces it is carried forward and upwards, so as to pass clear of the receiving chain combs, *g*,

as shown by the figure 7. The upward motion being still continued after the comb, Q, has passed the comb, *g*, the slide, P, will be forced outwards by the full side of the cam, G, and on the reverse motion of the rocking or balance lever, O, the cam being caused to move it, and the slide being consequently kept out, the working comb, Q, will descend and pass close to the receiving comb, *g*, and deposit the clear or finished work on the outer or further side thereof, and leave only the noil on the inner or nearer side, as shown by the figure 8. By the above operation the liability to loop upon the brooches or teeth of the comb is greatly lessened, and consequently also the breakage of the fibre is much diminished while being drawn off the comb, which is a very common occurrence in many machines. The wool or other material after being deposited upon the receiving chain comb, may be pressed down by a brush or other suitable means. The continued action of the machine will bring the several parts into their original positions, when the above operation will be repeated, and separate portions of the material will be successively acted upon as before set forth. The noils may be brushed out from the receiving combs by a revolving brush driven by the machine, but not shown in the drawings, or may be removed in any other convenient manner. The receiving combs are to be heated by steam, or in any other approved way, when oil is used in combing. When steam is employed for this purpose it may be applied by means of two pipes placed at the lower part of the machine between which the combs may pass before going again upwards. It is here to be observed that although we prefer to effect this improvement in the manner hereinbefore described, the same may be accomplished, if desired, by a traversing motion of the axis of the rocking or balance lever, which will dispense with the slide, P, together with those parts of the machine which are employed for working it. It is also to be observed that instead of the single machine hereinbefore described and represented in the drawings, double or even wider machines may be made; that is to say, working with two or more rocking or balance levers and working combs, either on traversing axes or without them, and only one series of driving gear, and one chain or set of receiving combs; and in the case of a whole or double machine the driving gear, instead of being on one side, is to

be placed in the middle, between those parts of the machine which are in duplicate.

With reference to our second improvement, the instrument or apparatus employed consists of a rocking or balance lever, formed without a sliding or moveable end, used with any suitable feeding and clearing apparatus as hereinbefore described; but the framework which carries the receiving combs, instead of being fixed to the main framing of the machine, is to be supported upon wheels or v slides, and a sliding coupling is to be adapted to the shaft which carries the bevel pinions, a^*, and b, (see fig. 2), and a receding and advancing motion of the said combs is to be given by suitable gearing in communication with the main part of the machine.

By this arrangement the action is as follows:—The working or transmitting comb, when moving in one direction, takes separate portions of the material, and passes them against the clearing surfaces as before. It then carries them to and past the receiving combs, which recede and allow it to pass quite freely; and afterwards, on the movement being reversed, it deposits the material upon the receiving combs, which advance towards it for the purpose. On the operation being continuously repeated, separate portions will be successively acted upon as before set forth.

With reference to our third improvement, we employ a rocking or balance lever, as in our second improvement, and any suitable feeding apparatus and clearing apparatus, as in both our first and second improvements, and also any receiving combs, as in our first improvement; but, instead of the working or transmitting comb depositing the material directly upon the receiving combs, we employ an intermediate carrying comb, as illustrated by the said views, figs. 9 and 10, in drawing No. III. These figures and the fig. 2 hereafter referred to are drawn to about half the scale of the other figures of the drawings; m, is a crank actuated by the machine; n, a slotted lever, to which it gives motion; n^*, the intermediate carrying such at the end of this lever; and p, a fixed pin or stud on which the lever works. The action is as follows:—The rocking or balance lever, o, being on its return or downward stroke when the crank is in the position shown in fig. 9, and turning in the direction denoted by the arrow, the lever, n, will be lifted and again depressed, and the angle of its inclination reversed, by the time the

crank reaches the position shown in fig. 10, as is represented by that figure. The comb, n^*, having been carried with it, will have lifted the wool or other material from the working or transmitting comb, Q, and will be just commencing to deposit it on the receiving combs, *g*, as shown, the completion of which operation will be effected by the further revolution of the crank. The fig. 11 shows a variation in the form of the chain or set of receiving combs, which may be adopted, if preferred. It is to be understood that any other description of intermediate carrying comb, and any different mode of working the same, may be substituted if deemed advisable.

It is to be observed specifically of the working comb, Q, or the rocking or balance lever particularly, if its end be made moveable, that the teeth should be shorter than in ordinary combs, because it is intended to be filled and emptied each journey that it makes, and also because with short teeth it can be made to pass closer to the receiving combs on the downward or delivery stroke. And it is to be observed generally of all the combs employed, that such sizes and descriptions of combs are to be used as are suitable to the nature and quality of the material to be operated upon, in accordance with the well-known requirements of all machinery for similar purposes. The drawings represent combs intended for operating upon the shorter descriptions of wool.

With reference to our fourth and fifth improvements, they are to be effected in the manner described under our first and second improvements respectively, by dispensing with the clearing apparatus and the gearing for driving the same. But it is desirable, when the carding or other clearing surface is dispensed with, that the material should have undergone a clearing as well as straightening process before being taken off, or combed by the working or transmitting combs.—In witness, &c.

CHARLES AUGUSTUS PRELLER.
JOHN EASTWOOD.
SAMUEL GAMBLE.

Enrolled March 16, 1853.

Specification of the Patent granted to HENRY BROWNING, *of Bristol, in the County of Somerset, Painter, for Improvements in Preparing Compositions for Coating Iron and other Ships' Bottoms, and other Surfaces.*—Dated January 18, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of combining white or red lead, without oil, black lead, and sugar of lead, with gum copal dissolved in spirits of turpentine. This compound is peculiarly suited for the first coating, and I have found that the sugar of lead may be reduced in quantity or left out for the subsequent coatings. And in order that my said invention may be most fully understood and readily carried into effect I will proceed to describe the means pursued by me.

The proportions of the above-mentioned ingredients may be varied, but I prefer to use them in the following proportions: one part of white lead by measure, one part by measure of red lead, one part by measure of black lead, and one quarter part by measure of the sugar of lead. If it be desired that the colour of the paint should be lead-colour the red lead is left out. These matters I grind with spirits of turpentine, and when for use I add gum copal dissolved in turpentine (white copal varnish), and in this state I apply the combined matters as a paint to the coating of ships' bottoms, applying a thin coating at first, and I leave out the sugar of lead in the second and subsequent coatings.

Having thus stated the nature of my said invention, and the manner of performing the same, I would have it understood that I make no claim to the use of the separate matters as paints;

But what I claim is the combination of the materials herein described for coating iron and other ships' bottoms.—In witness, &c.

HENRY BROWNING.

Specification of the Patent granted to HENRY LEACHMAN, *of No.* 13, *Compton-terrace, Islington, in the County of Middlesex, Colonial Broker, for Improvements in the Manufacture of Iron.*—Dated April 6, 1853.—(A communication.)

To all to whom these presents shall come, &c., &c.—My said invention consists in treating iron by means of certain materials, or a certain combination of materials, for the purpose of producing a more plastic and malleable iron than heretofore.

For this purpose I employ common brick-dust, salt, black oxide of manganese, and pig iron, as hereinafter mentioned. The first three mentioned materials are mixed together in the following proportions, that is to say:—

	lbs.
Common brick-dust . . .	120
Common salt (pounded fine)	600
Black oxide of manganese .	280
Making together .	1,000 lbs.

These three materials I cause to be thoroughly intermingled and reduced to a state of powder, which I use in the boiling process to which pig iron is usually subjected. When the metal is thoroughly melted and commences to rise, the powder is to be added, in quantities varying from four pounds to ten pounds weight, according to the quality of the metal. If the metal is of a very poor quality I use ten pounds weight to the heat of four hundred and twenty pounds of metal, and as the quality is superior, so less is to be used proportionately, up to four pounds, in doing which the manufacturer must be guided by experience. The powder should be added to or thrown into the metal all at once, at the same time stirring it briskly about, so that the whole gets thoroughly mixed, and the iron is then ready for use. Calcined clay may be used instead of brick-dust.

The use of this compound in the manufacture of iron, as above described, will be found to produce a metal of a very superior quality. And I claim as the invention for which the said letters were granted as aforesaid, the treating

of iron by or with a compound of materials as above described.—In witness, &c.

HENRY LEACHMAN.

Specification of the Patent granted to JACQUES FRANÇOIS DUPONT DE BUSSAC, *of No.* 36A, *Upper Charlotte-street, Fitzroy-square, in the County of Middlesex, Gentleman, for an Improved mode of Making with Iodine and its Compounds, in Combination with Substances containing Extractive Principles, various Elementary Combinations.* —Dated June 18, 1853.—(A communication.)

To all to whom these presents shall come, &c., &c.—The new processes I employ for obtaining the different productions I claim as constituting my invention are as follows:—

I place in a glass vessel or flask, first, iodine, secondly, a solution or watery decoction of the substances containing extractive principles, and make them boil together. Instead of a decoction or an infusion prepared beforehand, first, iodine may be put in the flask; secondly, water, and a portion of one of the substances containing extractive principles. By ebullition a portion of the iodine combines elementarily with the hydrogen of the water and extractive principles of the substance, and by this elementary combination forms a small portion of iodohydric acid.

This acid, while being created, helps to dissolve a fresh portion of iodine. This iodine, just dissolved, takes in its turn a portion of the hydrogen contained in the water and the extractive matter, and combines elementarily with that hydrogen, to form a fresh portion of iodohydric acid. The solution of iodine and its combinations with the hydrogenic parts of the liquid are thus renewed till there be no more iodine to be dissolved and to be transformed into iodohydric acid. As to the iodinic acid which, during these combinations, is created at the expense of the oxygen of the water and the extractive matters, it is soon under the influence of heat decomposed into oxygen and iodine; the iodine thus formed again combines elementarily with the hydrogenic matters of the solution, and is transformed into iodohydric acid.

The time of ebullition cannot be exactly determined; it

must be continued till the complete transformation of the iodine into iodohydric acid, when the starch is no longer coloured in blue by the solution. This iodohydric acid is liquid, free from all mixture, and stable; its colour is white, and similar to the colour of the solution, or of the decoction which has furnished the hydrogenized elements. The colour of the iodine has disappeared. It is, indeed, the spirit of iodine, which possesses all the medical qualities of iodine without having the smell, the taste, and the intoxicating properties of that metalloid. As the first idea of this transformation of iodine is owing to the labours of the celebrated French Doctor, Magendie, I term it "Magendie's Iodohydric Acid," or "Magendie's Spirit of Iodine." It may sometimes be necessary to first dissolve the iodine. One may then use the ordinary means of dissolving that metalloid, but the best solvent is liquid and pure iodohydric acid; the solution of iodine is then free from all extraneous matters. When iodohydric liquid acid is made by known means it is never pure; moreover, it only remains colourless a few moments, and changes nearly immediately into a reddish brown. This is caused by the oxygen decomposing the iodohydric acid into oxygen and iodine. The iodine freed by this decomposition is re-dissolved in acid not yet decomposed, and colours the mass, which re-assumes the smell, taste, and intoxicating action of iodine.

The iodohydric acid obtained by known processes is then never pure nor stable. But if, after having created the iodohydric acid by one of these processes, it be mixed with a solution of gum, or with a liquid containing extractive principles, a perfect combination of the parts of iodine with hydrogen of the water and of the extractive matters is effected; and this elementary combination forms a liquid iodohydric acid, perfectly stable. The ebullition, though not indispensable, hastens and perfects this elementary combination. Among the substances which, by their solutions and infusions or decoctions, simple or combined, may offer to the iodine the elements of an elementary and perfect combination, and facilitate its transformation into iodohydric acid, the following may be mentioned:—soluble gums, saccharine matters, cocoa or cocoa barks, lychens, rose leaves or hollyhock roses, angelica, dog's-grass, marsh-mallow flowers or flowers of the marsh-mallow, sarsaparilla, or the different sudorific woods, dates, jujubes, and all

bechic fruits, the four pectoral flowers, the flowers of the elder tree, saponary, borage, fumitory, woody nightshade, aquina, elecampane (also other emollient and bechic kinds of plants, and the roots of liquorice and marsh-mallow), gentian, scabius, violets and heartsease, the leaves of the walnut tree, camomile, roasted acorns, the barks of the various kinds of cinchona, (milk, butter-milk, caseum, fat broths, wine, beer, black coffee, vegetable oils, and even glycerine,) furnish the necessary elements for the transformation of the iodine into iodohydric acid; in a word, all the vegetable and animal substances containing extractive principles may be employed for this transformation of iodine. The quantity of substances to be employed in each operation depends on the quantity of iodine to be transformed, and on the relative quantity of the extractive principles contained in these different substances.

It is not absolutely necessary to submit to the action of fire most of these mixtures with the iodine; it is sufficient to expose them to the action of the sun or of the light to obtain their perfect combination with the iodine, and the transformation of the iodine into iodohydric acid, but then the combinations and transformations are much slower. All substances having extractive principles, after having assisted in the transformation of the iodine into iodohydric acid or spirit of iodine, preserve nevertheless all their peculiar medical properties; iodohydric acid, with gum, lychen, iodohydric oils, or oils with the spirit of iodine, &c., are then obtained.

Iodohydrates.—By the same processes and with the substances containing extractive principles elementary combinations may be obtained with the different iodides, and transform them into iodohydrates. One may also by the same processes and with the same substances create several iodhydrates without having recourse to the iodides.

Iodohydrate of quinine or spirit of iodine and of quinine.—1st means: dissolve some iodide of quinine, and mix that solution with the solution or decoction of a substance containing extractive principles; make the mixture boil; the iodine of the iodide will be transformed into iodohydric acid, and the product will be iodohydrate of quinine Magendie, or spirit of iodide and of quinine Magendie. 2d means: dissolve separately some sulphate of quinine or of pure quinine, and mix it with a solution of gum, or with any other decoction of substances having extractive principles;

mix with this solution some sulphate of quinine or pure quinine, either iodine dissolved or iodohydric acid; heat the mixture by a balneum mariæ; iodohydrate of quinine Magendie, or spirit of iodine and quinine Magendie, will thus be obtained.

By the same processes and the same substances, and by employing the iodides of cinchonine or of quinidine, or by mixing solutions of cinchonine or of quinidine with the iodine dissolved, or with iodohydric acid, iodohydrates of cinchonine or of quinidine are obtained.

Iodohydrate of cinchona Magendie, or spirit of iodine and of quinquina.—Put in a glass vessel or flask some iodine and bruised bark of cinchona and water; heat the mixture. The iodine combining elementarily with the hydrogen and the oxygen of the water and of the extractive principles contained in the bark of quinquina, will form iodohydric acid and iodic acid. The iodic acid will dissolve all the alkaline and constituent parts of the quinquina; then, by the effect of the heat, it will be decomposed and transformed into an iodhydric acid. The final result of the operation will be an iodhydrate of quinquina, containing all the acids and all the alkalies of quinquinas. For this iodhydrate to contain only the alkalies of quinquina, it would suffice to deprive, first, the barks of the cinchona of their different acids in boiling them in carbonate of soda and water. Both these iodhydrates of cinchona may be obtained by making the heated iodhydric acid diluted with water act on cinchona bark entire or deprived of its acid.

Iodhydrated powder of cinchona Magendie, or powder with spirits of iodine and cinchona.—The iodhydrate of cinchona must be made to evaporate at a small degree of heat on the bark itself of cinchona; when the whole is dry, pulverize it, or powder of cinchona may be imbibed with the iodhydric acid Magendie, much concentrated; dry it again, and pulverize it again.

Iodhydrate Magendie of quinine and iron, or of cinchona and iron, or spirit of iodine and quinine, or of iodine, cinchona, and iron.—To obtain this iodhydrate it is sufficient to add to the elements constituting iodhydrates of quinine or of cinchona a salt of iron, and especially the simple citrate of iron, or the malate of iron, which have no bad ferruginous taste.

Iodhydrate of the acids of cinchona Magendie, or spirit of iodine, and the acids of cinchona.—Boil in water some

cinchona bark; this decoction will only contain the acids of the cinchona, and some extractive principles; filter the decoction, and add a portion of iodine, dissolved or not dissolved; boil the whole in a glass flask till the iodine be transformed into iodhydric acid. The result will be iodhydrate of the acids of cinchona.

Iodhydrate of starch Magendie, or spirit of iodine and starch.—Mix with some starch some dissolved iodine. Put the mixture in a glass flask, and add to it a solution or decoction of a substance containing extractive principles. Heat the mixture. By the combination of the iodine with the hydrogen of the water and the extractive matters, the iodine is transformed into iodhydric acid, and thus the colour and taste of the iodine will disappear, and the result will be liquid iodhydrate of starch. One may obtain solid iodhydrate of starch by imbibing starch with iodhydric acid Magendie. The starch is afterwards dried at a gentle heat, and it may then be again turned into powder.

Iodhydrate or biniodhydrate Magendie of sulphur, or spirit of iodine and of sulphur.—1st means: dissolve some iodide of sulphur by the means generally used, or by iodhydric acid Magendie. Mix this solution with a solution of gum, or with a decoction of substances with extractive principles. Heat the mixture; the iodide of sulphur will lose its colour, its taste, its smell, and the product will be iodhydrate or biniodhydrate of sulphur Magendie.—2d means: triturate together one part of sulphur and four parts of iodine, dissolve them in iodhydric and Magendie, and mix the solution with a solution of gum water, or with a decoction of a substance containing extractive principles. Boil the mixture; the result will be iodhydrate of sulphur.

Iodhydrate or biniodhydrate of lead, of zinc, silver, gold, ammonium, arsenic, or mercury, or spirit, &c.—Dissolve some iodide of lead, or of zinc, silver, gold, ammonium, and arsenic, mercury, or biniodide of mercury, either by known means or by iodhydric acids. The simple iodide of mercury is best dissolved in the glycerine. Mix this solution with a solution of gum water, or with a decoction of substances containing extractive principles. Boil till the iodine be transformed into iodhydric acid. The result will be an iodhydrate or a biniodhydrate of lead, zinc, silver, gold, arsenic, mercury, ammonium. If, with the solution containing extractive principles, there be mixed at the same

time iodide of mercury and iodide of arsenic, the result is a double iodhydrate of mercury and arsenic.

Iodhydrate of manganese, and of manganese and iron, or spirit, &c.—Put in a flask, 1st, iodine; 2d, sulphate or carbonate of manganese, or even peroxide of manganese; 3d, a solution or decoction containing extractive principles. Heat the mixture. The iodhydric acid in being created will dissolve either the sulphate or carbonate of manganese, or the peroxide of manganese. When all the iodine is transformed into iodhydric acid, the result will be iodhydrate of manganese. By adding in the flask a little iron filings, or peroxide of iron, or a salt of iron, the result is an iodhydrate of manganese and of iron; if the citrate of iron or malate of iron be used, the iodhydrate of iron and of manganese will have no bad ferruginous taste.

Iodhydrate of phosphorus, or spirit of iodine and of phosphorus.—Put in a flask the normal proportions of iodine and phosphorus; moreover, a solution or decoction containing extractive principles. Heat not only to the transformation of iodine into iodhydric acid, but till the cessation of the white and opaque vapours, which proves the complete evaporation of the phosphorous acid. You can afterwards concentrate, more or less, the solution, as that of medical phosphoric acid. The result is iodhydrate of phosphorus.

Iodhydrate of iron, or spirit of iodine and of iron.—Dissolve some iodide of iron in a solution of gum water, or in the decoction of a substance containing extractive principles. Boil till the iodine be transformed into iodhydric acid. The result is iodhydrate of iron. But this iodhydrate of iron only contains, and can only contain, but one-sixth of iron against five-sixths of iodine.

To obtain an iodhydrate of iron containing a greater proportion of iron.—Put in a flask, 1st, iodine; 2d, a solution of gum, or a decoction of a substance containing extractive principles; 3d, a salt of iron, and especially citrate and malate of iron, in the desired proportions. Boil to the transformation of the iodine into iodhydric acid. According to the quantity of salt of iron which will have been added to the solution, the result will be an iodhydrate double, triple, or quadruple, &c. of iron.

All these different products above enumerated preserve at the same time the curative properties of iodine, and the properties of the different substances that have been combined elementarily with the iodine. One may then use

these products to make syrups, lozenges, paste, biscuits, or medical chocolates and medical oils or pomatums, waters for the toilet, injections, lotions, baths, ærated waters, powders for the teeth, or other powders; in a word, prepare all the medicines in which iodine is necessary, either in its simple state or combined with other substances, as above described.

I claim, first, the production of an iodhydric acid, pure and stable, by the processes above indicated, under the name of iodhydric acid Magendie, or spirit of iodine Magendie.

Secondly, the production of the different iodhydrates or biniodhydrates above described.

Thirdly, the production of iodhydrated oils, as described.

Fourthly, the production of iodhydric powder of cinchona, as described.

Fifthly, the manufacture by the aid of iodhydric acid Magendie, or of the different iodhydrates or biniodhydrates, above described, of medicines of all kinds in which iodine is necessary.—In witness, &c.

JACQUES FRANÇOIS DUPONT DE BUSSAC.

Specification of the Patent granted to JAMES MAYELSTON, ***of Elloughton, in the County of York, Gentleman, for Certain Improvements in the Manufacture and Refining of Sugar.*** **—Dated June 3, 1853.**

To all to whom these presents shall come, &c., &c.—After any saccharine fluid or solution from which sugar is to be produced has been duly evaporated and crystallized, I take the semifluid compound of crystals and mother syrups, newly produced by the concentration and crystallization thereof, and while such compound is in the usual or a fit state for being poured into moulds or other curing vessels, I pour or admit it into a large open vessel (to be hereinafter called the "draining vessel") having at a few inches above the bottom thereof a perforated false bottom or strainer, covered with wire-gauze, horse-hair, cloth, or other material, such as shall allow the syrup, but not the crystals, to pass through; but previously to admitting the said compound into the vessel, I provide that the shallow space below the strainer be completely filled with syrup or other fluid, in order to resist the premature draining off of the

mother syrup. The draining vessel may be two feet deep, more or less, above the strainer, and whatever the material of which it is constructed, it should be very rigid in every part; it should be a few inches wider at top than bottom, and the smoother the interior the better. The bottom of the vessel should have a slight descent towards the outlet provided for the escape of the syrup, but the top edges and the false bottom should be set quite level. The false bottom may be conveniently made of narrow battens, with intervals of a quarter of an inch between, and be cross battened underneath. The upper battens may be perforated with countersunk holes of three-eighths of an inch diameter, more or less, and an inch, more or less, distant from each other. The end way of the wood should, by preference, be placed towards the longer sides of the vessel, if such there be, and the whole should be held down by screws or otherwise to a ledge round the bottom of the vessel, and likewise supported at proper intervals below. And I generally suspend the pneumatic drainer upon gudgeons placed at its ends, nearly opposite to the centre of gravity, with a wheel and pinion for the purpose of inverting and discharging it. And I usually provide it with a steam case underneath the bottom, into which steam may be admitted, if requisite, for the purpose of maintaining the fluidity of the mother syrup during its passage out; also, with the means of injecting steam into the space below the false bottom, for the purpose of clearing the strainer occasionally. The space below the false bottom, hereinafter called the "syrup chamber," is connected by means of a cock or valve with a pipe, hereinafter called the "exhaust pipe," which leads to an air-pump or other exhausting apparatus, and also to a close vessel, hereinafter called the "receiver," placed lower than the bottom of the "draining vessel" for the purpose of intercepting the syrup as it flows towards the air-pump, which "receiver" I usually provide with the means of heating, in order to maintain the fluidity of the mother syrup when withdrawn, as hereinafter mentioned, in a hot state.

The hot semifluid compound having been admitted into the pneumatic drainer, as before mentioned, is left at rest awhile therein for the crystals to arrange themselves, or so long as the operator may think suitable to the quality of the sugar, and the purpose for which it is designed; but before it becomes fixed or consolidated into a mass by

cooling, the communication with the exhausting apparatus is opened, and by means of atmospheric pressure the mother syrup is gradually withdrawn from the crystals, which operation is continued till the syrup is sufficiently drained off. I generally have a barometer connected with the exhausted spaces, and regulate the exhaustion by a vacuum valve, loaded so as to produce the pressure from time to time required, of which in practice the experienced operator will readily judge. The draining being finished, I draw air copiously through the mass of crystals, for which purpose it is desirable to employ a separate air-pump of large capacity, and I continue this operation till I judge the mass to be sufficiently cooled, whether for removal or for further operations, as the case may be. I then stop the exhaustion, and withdraw the mother syrup from the receiver, to be boiled down or otherwise disposed of. If the drained crystals are intended to be sold without further purification, I disconnect the "draining vessel" from its steam and exhaust pipes, though this may be avoided if the connexion be made through the gudgeons upon which the vessel turns, or through pipes made of flexible materials strengthened internally with a coil or rings of metal. I then loosen the sugar from the sides and bottom, invert the vessel, and discharge its contents into a truck placed underneath. But if the crystals are to be further purified, I leave the mass in the vessel without being loosened, and proceed (as in the usual method of treating sugar when in moulds) to level the surface, and to cover it as equally as may be with the ordinary magma of sugar and water; which done, I again produce a regulated exhaustion (beginning gently until the fluid portion of the magma is drawn into the mass), and continue it according to the judgment of the operator, and follow it up during the further processes of washing and blanching the crystals by the usual application of "liquors," or any substitute for the same. To assist in judging whether the blanching is complete, I connect with the exhaust pipe a glass tube furnished with a stop-cock at either end, into which a sample of the syrup may be admitted from time to time as it flows, and its colour ascertained. The crystals being sufficiently blanched, I again increase the exhaustion to its utmost limits, and continue to draw a copious stream of air through the mass till it is sufficiently drained and dried, when I stop the exhaustion, and proceed as before mentioned to discharge the contents

of the vessel. The syrup may be withdrawn from t receiver at any stage of the process, and separated into d ferent qualities to suit the purpose of the operator. As t mass of crystals in parting with the mother syrup in a wa state is liable to become too porous, especially for the su sequent operation of liquoring, I sometimes vary the abo process or processes in the following manner: that is say, soon after the crystals begin to be left bare at top the draining off of the mother syrup, and while the m is still warm enough to be compressible, I place upon surface a stout wooden cover nearly large enough to tou the sides of the vessel, and over that cover I lay an i proof cloth made of or bordered with india-rubber sheeti some inches larger than the area of the vessel, so that edges of the sheet shall turn up an inch or two against sides. I then place four stiff wooden bars upon the sh (one along each edge), and press them against its turn up edges by means of clamps or otherwise, so as to co press the india-rubber against the sides of the vessel order to make an air-tight junction all round, assisting needful, with packing or a luting made by mixing pulveri sugar into a stiff mass with syrup. I then increase exhaustion, so as by the weight of the atmosphere upon wooden cover to compress the mass of crystals, the stret ing of the india-rubber allowing the compression to be lowed up in proportion as the syrup is squeezed out bel and I continue this operation till I judge the consolida to be sufficient, or till no further compression takes pl I then remove the covering and withdraw the rest of mother syrup by atmospheric pressure admitted betw the crystals as before. Sometimes also I vary the proce by allowing the semifluid compound of crystals and mo syrup to cool and consolidate before I commence the moval of the syrup, and this is sometimes necessary w the sugar is weak and liable to paste from compression.

The processes as above described are applicable to manufacture of sugar intended to be sold in loose or s rate crystals. When lump sugar is to be made, to wit, su in moulded shapes, I modify the process as follows: that i say, I arrange or place within the pneumatic drai vessel, upon or supported a short distance above the i bottom or strainer, the requisite number of moulds shapes, which may be entirely open at bottom as wel top, and of any convenient form, such as that of the frus

of a cone inverted; but the form which I prefer for the economizing of space is that of a hollow pyramid of six sides inserted, cut off at the lower or smaller end, and entirely open both at top and bottom. I likewise prefer to unite a number of such six-sided moulds into one piece, by casting or otherwise, so as to form a series of hexagonal cells like those of a honeycomb, the whole number required to fill the vessel being, if needful, divided into convenient sections. And I make the moulds or cells just as long as the lumps of sugar are intended to be when finished; and in order to economize space I prefer to give them as little draft, strip, or taper as may be consistent with the ready extraction of the sugar moulded therein, which will depend upon the material of which they are made, and the greater or less smoothness of their inner surfaces. And the moulds or cells being arranged, and the chamber below the false bottom filled with syrup, as before mentioned, I admit the hot and semifluid compound, hereinbefore described, into the vessel till it entirely fills and buries the moulds or cells, and rises three or four inches more or less above their tops, so that when the mass of crystals shall have been shrunk to the full extent by the draining of the mother syrup and the subsequent washing, there shall still be an inch, more or less, of sugar above the tops of the moulds or cells. The proper allowance to be made for this last purpose will depend upon the length of the moulds and the quality of the sugar, and will be readily determined in practice by the experienced operator. After waiting a longer or shorter time for the crystals to arrange themselves, or so long as the operator may think suitable to the quality of the sugar, I proceed, as hereinbefore described, to withdraw the mother syrup, and to wash away from the crystals the adhering portions thereof by magmas and liquors applied over the whole surface of the sugar, proceeding as if it formed one undivided mass. In operating with moulds I commonly begin to withdraw the mother syrup before the crystals become consolidated into a mass by cooling, and in that case I usually employ the means hereinbefore described of compacting the mass of crystals by atmospheric pressure, while still warm and soft enough to be compressible. But I sometimes vary the process by allowing the said semifluid compound to cool and consolidate before commencing the removal of the mother syrup, especially when the sugar is weak and liable to paste, as

hereinbefore mentioned. The masses of crystalized sugar having been sufficiently drained and washed, I pare down and remove the superfluous sugar above the tops of the moulds or cells. I then increase the exhaustion as far as may be, and draw air through the interstices of the crystals for the purpose of partially drying them. I next proceed to remove the sugar from the vessel by any convenient method; that which I usually adopt being as follows:—I place upon the tops of the moulds (now laid bare by the removal of the surface sugar) a stout wooden cover (in separate pieces, if desired), large enough nearly to meet the sides of the "draining vessel," the end of the wood being, by preference, placed towards the two longer sides thereof, if such there be. Against each of these two sides, and extending the whole length of them, I place a holding-down plate of iron edgeways up, resting in a groove running along the ends of the planks that form the cover, the said holding-down plate being broad enough to reach from the cover up to the edge of the vessel or thereabouts. Some clamps which are attached by strong chains to the exterior of the vessel are next brought up and placed over the upright edges of the holding-down plates and of the vessels so as to secure them together, and so that on the inversion of the vessel they and the chains attached to them may be capable of sustaining the entire weight of its contents, which, on the sugar parting from the vessel, will rest upon them. I then invert the vessel; immediately under its mouth, and on a level with the floor below, is a moveable floor or lift provided with machinery below for raising it when required, and with rails upon its surface for receiving and guiding the wheels of a truck. Upon this lift I now run a truck carrying a stout wooden top, which, to distinguish it from the "wooden cover" before mentioned, I will call the "table," and which is of such dimensions that on the rising of the lift it shall enter within the inverted vessel, rise between the holding-down plates before mentioned, and be thereby guided into its ultimate position, when it will press up against the "inverted cover;" this "cover" is pierced with holes so arranged as to coincide with the angles of the moulds or with portions of their edges, and the "table" is covered with blunt spikes standing upright and corresponding in number and position with the holes in the "cover," which blunt spikes are long enough to reach through these holes and about half an inch beyond the thickness of the

"cover;" but by the interposition of some loose wedge pieces about half an inch thick between the "table" and the "cover" (which are placed upon the "table" before it is lifted) the blunt spikes are, in the first instance, prevented from passing beyond the thickness of the "cover" and only permitted to come in contact with and press against the angles or edges of the inverted moulds. The lift having been raised till the spikes press against the moulds and the wedge pieces against the inverted "cover," it is to be fixed securely in that position. The clamps being next set free, together with the holding down plates, the "cover" now rests solely upon the half-inch wedge pieces, while the moulds are still supported upon the blunt ends of the spikes. The lift being next lowered, the whole mass of sugar and moulds, together with the "cover," become detached from the suspended vessel (which is made with sloping sides to facilitate the separation), and descend along with the "table" and truck. Should there have been, as hereinbefore recommended, a small space between the false bottom and the moulds, a stratum of sugar equal thereto will now cover the ends of the inverted moulds: this stratum is to be cut away, and the lumps or loaves of sugar trimmed nearly level with the edges of their respective moulds. This done, and the loose sugar removed, together with any sugar which is exterior to the mass of moulds, the thin wedge pieces (which alone support the "cover" as before mentioned) are withdrawn, and the "cover" drops upon the "table," leaving a vacancy of half an inch, more or less, below the lumps or loaves of sugar. The loaves of sugar having no longer any support, except that which is derived from their adhesion to the moulds, are now at liberty to detach themselves and to drop down upon the "table" through the vacancy of half an inch, but it is generally necessary to detach them by the blows of a mallet, or other means, applied to their extremities. When they are all detached, the lift is to be raised with its whole load till the moulds again reach their place within the inverted vessel, where they must be temporarily secured by screws through the sides of the vessel, by clamps over its edges, or by other means, till the vessel can be turned back to its proper position. The lift is now lowered again. The empty moulds remain suspended in the vessel, but the truck descends, bearing upon it the "table," the "cover," and the naked lumps of sugar, which are then wheeled away to

be ready for papering. The "draining vessel" being then reverted is ready to receive another charge. If separate moulds are used, they may be stripped from the loaves before the lifting of the truck, and placed in the vessel after it is reverted.

In all the operations hereinbefore described it is important that the sugar in the draining vessel be of equal depth in every part, which, on first filling the vessel, is secured by the level position of the false bottom. In the subsequent manipulations the edges of the vessel (which are likewise level) may be used in the principle of the "straight edge" as the means of preserving this equality of depth, by restricting to a uniform depth the edge of any cutting instrument employed in preparing the surface of the sugar for the magmas and liquors, and of any instrument employed for stirring and equalizing the magmas and mixing the liquors with the loose sugar ploughed up by the cutting instrument. For this purpose the instruments may rest upon a slide laid athwart the vessel, and have liberty to traverse from side to side upon it, and to move from end to end with it. If during the operations air be drawn through any particular part of the sugar in an undue degree, that part should be carefully compressed, and, if necessary, obstructed by means of the luting of sugar before mentioned, or in any convenient manner.

For the withdrawing of syrup from sugar by means of the "draining vessel" it is not at all times necessary to employ an air-pump or other exhausting machine, inasmuch as the same effect practically may be produced by the descent or sucking action of a column of syrup in a pipe connected with the syrup chamber, the lower extremity of the pipe being re-curved or plunged into a vessel full of syrup by way of "waterjoint." And provided that the pipe and the syrup chamber be in the first instance completely filled with syrup up to the level of the straining cloth, the sucking action will continue till the syrup be drained away from the crystals, and the process may be conveniently regulated by means of a stop-cock inserted in the said pipe.

In the draining and purifying of sugar, as hereinbefore described, the injury caused by fermentation is greatly diminished by reason of the shortening of the processes. For a like object I employ the following method or methods of regulating the temperature of saccharine fluids reserved

for use in the manufacture and refining of sugar, in order to avoid those temperatures which most conduce to fermentation; that is to say: I attach to the vessels containing such fluids any apparatus which, acting on the well-known principle of the expansion and contraction of materials, or their unequal expansion and contraction, by change of temperature, may by the contact of such materials with such saccharine fluids, and the expansion or contraction produced thereby, impart motion to, and open, shut, or regulate, any valve or other apparatus whereby heat is admitted to or excluded from such vessel or such fluid, so as thereby to raise or maintain the temperature of such fluids above the limits at which fermentation is most liable to take place without exceeding another given limit. For this purpose I prefer to maintain the temperature of any such fluid between 120 degrees and 140 degrees of Fahrenheit. And such apparatus may be constructed in various ways, such, for example, as the following: A flat band of iron or galvanized iron, and another of brass, of equal length and width, are soldered or rivetted in numerous places together, and then formed into a coil, the outer extremity of which is to be fixed to and within a metallic hoop surrounding the coil, while the central extremity is soldered or rivetted to a pivot placed at right angles to the plane of the coil, and in or near its centre. Two metallic bands are attached to the hoop across its diameter, one under and the other over the coil, but not touching it, with a socket in the middle of the lower one for the pivot to rest in, and a hole in the middle of the other through which the pivot passes upwards. The hoop is firmly secured within the vessel containing the fluid whose temperature is to be regulated, and near the bottom thereof. The pivot may be long enough to rise to the top of the vessel, where a stay is to be fixed, in which it may freely revolve. A toothed wheel, a pulley, or other contrivance is affixed to its upper extremity for the purpose of multiplying any motion which it may have upon its axis, so as thereby to work a light throttle valve by which steam or other hot fluid is admitted to the vessel for the purpose of heating its contents. The action of the apparatus is as follows: since brass expands and contracts more than iron with equal variations of temperature, if the coil be formed with the brass outward any rise of the temperature in the surrounding fluid will tend to coil it closer, or, if the iron be outwards, the

contrary. But its outer extremity being, as before mentioned, a fixture, the motion imparted to the coil is all thrown towards the central extremity, and thus made to act upon the pivot, to which it imparts more or less motion upon its axis. In constructing the apparatus the multiplying motion should be so adjusted by trials that the last wheel or motion of the series shall make a quarter of a revolution in either direction, as the case may be, when the temperature of a fluid in which the coil is immersed rises from 120 degrees to 140 degrees, or falls from 140 degrees to 120 degrees. This last wheel or motion being fixed upon the axis of the throttle valve will thus close the valve when the fluid reaches 140 degrees, and entirely open it when the fluid sinks to 120 degrees, and thus regulate the temperature between those points so long as there is any supply from the source of heat. Or the same object may be attained by means of a series of compound metallic bends formed into bows of slight curvature, having one metal on all the convex sides of the bows, and the other on all their concave sides. The bows being arranged in pairs with the concave sides facing each other, the extremities are to be rivetted together at the points of meeting, and then each of such pairs is to be rivetted at the middle to the middle of the next pair, the convex side of one to the convex side of the next, so that when finished and in their place they will form a series of such double bows lying in the same plane, the concave sides face to face rivetted together at the extremities, the convex sides back to back and rivetted together at the middles; the outside of all the bows made of the one metal, their insides of the other, and the whole series is to be laid horizontally upon a frame within the vessel in contact with any fluid contained therein. The last bow at one extremity of the series is to be fixed by the middle to one end of the frame. The remainder of the bows being at liberty to slide to and fro upon the frame, the last bow at the other extremity will receive the united motion of the whole series as they expand or contract. To the middle of this last bow may be attached a horizontal rod passing through a guide or collar fixed upon the other end of the frame, and from this rod the motion may be conveyed in any convenient manner to the spindle of the throttle valve. Or the same object may be attained by the expansion and contraction of a fluid enclosed in pipes which have only one outlet, through which outlet the fluid, as it

expands or contracts, shall give motion to a piston or other contrivance by which the required motion may be conveyed to the throttle valve. The same principle may be applied in various other ways, the materials employed, and their arrangement, being indifferent, provided their expansion and contraction effect by spontaneous action the admission or exclusion of heat to or from the saccharine fluid. And I apply this contrivance to the better preservation of liquors, syrups, sweet or wash waters, and other saccharine fluids, used or reserved for use in my hereinbefore-described processes, or in any processes of the manufacture and refining of sugar, more especially when such saccharine fluids are unavoidably kept from day to day; and, lastly, it being requisite to use the said liquors at a much lower temperature than 120 degrees, I cool them as and when they are wanted for immediate use by means of any convenient refrigerator, which is cooled by a current of cold fluid; and I sometimes run the liquors direct from the filter or its receiving cistern through such refrigerator.

Having thus described the nature of my said invention, I would state, that I am aware that atmospheric pressure induced by exhaustion or suction, has before been used for cleansing Raw, Muscovado, and other sugars, which have been previously drained of their mother syrups by other means and in other vessels or apparatus; I do not, therefore, claim the use of apparatus for such a process. But what I claim is,—

First, the employing of atmospheric pressure induced by exhaustion or suction in vessels with false bottoms or in moulding apparatus combined or used therewith, as hereinbefore explained, for the purpose of facilitating the draining of the mother syrup from crystals of sugar, which along with their mother syrup have been admitted into such vessels or such moulds when in or about the state in which sugar is usually moulded, that is to say, in a state of sufficient fluidity whilst hot to admit of being poured into vessels, and of sufficient consistency to become fixed on cooling, and also for the purpose, when desired, of subsequently washing or liquoring the said crystals in such vessels or moulding apparatus.

Secondly, I claim the suspending of pneumatic draining and cleansing apparatus in such manner as to admit of being readily inverted to facilitate the discharging or unloading the same.

Thirdly, I claim the means herein-described of retai saccharine fluids between given degrees of temperature, thus preventing fermentation in such fluids.

Fourthly, I claim the moulding, draining, and clear of sugar by the aid of pneumatic pressure in hexa moulds, so united or placed together in one common v or within one common boundary as to admit of the sug them being drained or washed in common.—In witness

JAMES MAYELST

Specification of the Patent granted to JOSEPH CI DANIELL, *of Bath, for an Improvement or Improve in Preparing Food and Litter for Cattle, Pigs, and Animals.*—Dated August 3, 1853.

To all to whom these presents shall come, &c., Heretofore when hay, whether made of meadow clover, or other herbal, straw, or halm, has been giv animals as food, it has been in the hard state, and th preparation to which such matters have been subjecte been by cutting the same into short lengths or chaff. the object of my invention is to prepare such descripti dry vegetable matters with a view to aid masticatio digestion, when they are used for food of animals straw and stalks of herbage, when similarly prepare be rendered more suitable and may be more usefully a as litter for cattle, pigs, and other animals. And my tion consists of causing such matters to be cut into cl short lengths, and, when in a dry and brittle state, t ject the same to the action of a suitable mill to be cr and ground.

Having thus stated the nature of my said invent will proceed to describe the manner of performing the Hay (whether made from meadow or other grass, or herbage) or straw, the halms or straw of beans and p the halms or straw of other dry herbage, which may b as food or litter for animals, is first to be cut into lengths as chaff has heretofore been cut, by any st machines or instruments put in motion by hand or p after which, in order to get any such cut matter in and brittle state, the same is to be dried in any su manner. I prefer for this purpose a kiln, such as is

for drying malt, though other well-known means may be employed, in order to drive off moisture. The dry matter is next to be subjected to the action of a suitable mill to crush and grind the same; for which purpose I prefer to employ edge-stones, such as are used by dry salters and others; and by such means I cause the matter, whether intended for food or litter, to be ground, taking care to move the same continually whilst it is under the stones, so that the matter may be equally subjected to the crushing and grinding. When the food is intended for cattle and other animals usually fed on hay, the crushing and grinding need not be carried to the extent of reducing the matter or matters to meal or powder; but when intended for the food of pigs and other animals not usually fed on hay, the chaff should be cut into very short lengths, in order to facilitate its reduction to meal or powder, and in some instances it would be necessary to pass it through a sieve, to separate the parts not sufficiently reduced for such, or to pass it through a machine, such as is used by millers for separating the bran from the flour; and then it is given them with other wet food. Although I have mentioned edge-stones as those preferred, I do not confine myself thereto, as other constructions of mills, such as those used for grinding wheat, may be used in place thereof. And I would state, that I make no claim to the construction of chaff-cutting machinery or instruments, nor to the construction of kilns or apparatus used for drying, nor to the construction of mills employed for crushing and grinding.

But what I claim is, the manufacture or preparation of food and litter for animals, herein described.—In witness, &c.

JOSEPH CLISILD DANIELL.

Specification of the Patent granted to BENJAMIN COLLINS BRODIE, *junior, of* 13, *Albert-road, Regent's-park, in the County of Middlesex, for Improvements in Treating or Preparing Black Lead.*—Dated July 28, 1853.

To all to whom these presents shall come, &c., &c.—The object of this invention is to obtain black lead in a very fine state of division. For this purpose the black lead is to be broken down to coarse particles, and then subjected to heat with acid, preferring a mixture of sulphuric and

chromic acid. The acid is drained and pressed out, and the remaining acid washed out with water. The black lead is then dried and subjected to a red heat.

Having thus stated the nature of my invention, I will proceed to describe the manner of performing the same, and in doing so I would state that black lead is very different in quality, some being comparatively pure and others more or less impure; and the process when the black lead requires more purification differs from the process when little purification is considered necessary. When acting on black lead, whether less or more impure, according to my invention, I proceed as follows:—The black lead is first reduced to a powder by stamping or grinding. This powder is then mixed with concentrated sulphuric acid, using about one part by weight of the powdered black lead to six or eight parts by weight of sulphuric acid; a small quantity (say about one-twentieth by weight of the black lead) of chlorate of potash is to be thrown into the mixture gradually, and the mixture is to be stirred. The temperature of the mixture is then to be raised to about that of boiling water, and kept at that temperature till the cessation of chlorous fumes; when cold, the black lead is to be well mixed or stirred in a large quantity of water, and then to be allowed to stand; after a time the black lead will settle to the bottom, and the fluid is to be drawn or run off; the remaining acidulated water is to be washed out of the black lead by further quantities of water, and these matters are to be separated by decanting or by filtration, or by both. The black lead is then to be slowly dried at a moderate heat, and when dry is to be raised to a red heat in a crucible or otherwise. The black lead will, when cold, be in a light state of subdivision, and may be used for the purposes for which black lead in the state of powder has before been employed; but the black lead may be separated from impurities by stirring it in a quantity of water; the black lead, when allowed, will float at the top of the water, and impurities will deposit; by such means the black lead may be separated from nearly all of its impurities. I would here remark that, in place of chlorate of potash above mentioned, chromate and bichromate of potash, and many other chemical substances, known as oxidizing agents, may be used; but, according to my present experience, I believe chlorate of potash to be the most suitable for the purpose.

It is well known that there are varieties of black lead

which are impure by the presence of silica or silicates. In such cases, when treating with reference to the silex or silicates present, I add such a chemical matter as will produce hydrofluoric acid when mixed with sulphuric acid, and I prefer to apply fluoride of sodium, and I add it after the black lead has been mixed with sulphuric acid, and in proportion to the silex or silicates present in the black lead. The process in other respects is conducted as above explained.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I do not confine myself to the details herein described, so long as the peculiar character of the invention be retained.

But what I claim is, the treating and preparing black lead with sulphuric acid, as herein described.—In witness, &c.

BENJAMIN COLLINS BRODIE.

Specification of a Patent granted to JAMES LEE NORTON, *of No.* 8, *Holland-street, Blackfriars, in the County of Surrey, for Improvements in Obtaining Wool from Fibres in a condition to be again used.*—Dated August 5, 1853.

To all to whom these presents shall come, &c., &c.—Heretofore it has been usual to obtain fibres from fabrics when in a dry state, by which much dust is thrown about and the fibres are much broken and injured, and it has been proposed to submerge them in water and to reduce them to the state of fibre by the action of machinery working in water, as in the manufacture of pulp.

The present invention consists in causing fabrics containing wool alone or combined with other fibres to be reduced into the fibrous state when in a moistened condition, by which the throwing about of dust is avoided and the fibres are less injured than when acted on in the dry state. I steep or wash the fabric to moisten it, or I steam the fabric; and in one or other of such states of saturation or moisture I subject the fabrics to the action of the machine or machinery for reducing it to fibre.

Having thus stated the nature of my said invention, I will proceed to describe the means pursued by me.

I cause the rags or portions of fabrics to be
in water, or for a few hours by preference in lime
or in place thereof with water having fuller's earth
therewith, as the use of lime or fuller's earth appe
assist the unravelling of the fibres, and having beat
rags or pieces of fibre in a fulling stock, I then
the rags or pieces of fabric to be reduced to fi
machinery such as has heretofore been used when act
the fabric in the dry state. After the fibre has
obtained, it is to have the water separated therefro
the fibres are to be dried. The separation of the
from the fibre I believe may be most conveniently d
centrifugal "hydro-extractors." It is not essential t
rags or pieces of fabric should be soaked and wash
above explained, as the water may be used immed
before the rags or pieces of fabric are acted on
machinery which is to reduce them to fibre; and in p
using water, the rags or pieces of fabric may be
into a box or chamber, and well steamed till the
is saturated with moisture.

Having thus described the nature of my inventio
the manner of performing the same, I would have it
stood that what I claim is, the opening fibres of woo
rags or pieces of fabric by subjecting such rags or
of fabric to the action of the machinery in a moi
or saturated condition in place of a dry state as
described.—In witness, &c.

JAMES LEE NOR

Specification of the Patent granted to WARREN DE LA
of Bunhill-row, in the County of Middlesex, fo
provements in the Means of Treating and Pre
Certain Tar or Naphtha, and applying products the
Dated July 25, 1853.

To all to whom these presents shall come, &c.,
It is well known that that the native petroleum na
or tars are composed of various fluid and solid hydroc
which boil at varying temperatures and can therefo
separated by processes of distillation, and the object
invention is to effect this separation economically

to render these products available for useful purposes, such as varnish making, combustion, and illumination, lubrication of machinery or wheel work, and the solid product for the manufacture of candles and other uses.

I will now proceed to describe the means I employ.

First, in order to prevent the loss as much as possible of the more volatile constituents of the native petroleum, which in the case of rangoon tar I have found to occur when it is imported in wooden barrels, I cause it when collected at the natural sources to be at once placed in metallic casks or tanks having an aperture of convenient size for the introduction of the liquid or pasty material, as the case may be, and which aperture is to be closed hermetically as soon as possible; as a precaution I prefer to have a tin plate soldered over the opening.

In order to exclude the solid constituent as much as possible from the first products of distillation, and also to prevent the natural tar being altered by the long continuance of a high temperature, I effect its partial distillation by blowing low-pressure steam through it. To effect this I introduce the petroleum into a metallic or other still, which is connected with a refrigerator cooled by a continuous current of cold water. This still should be capable of holding twice the bulk of the tar employed, but its form is not material (a plain cylinder answering as well as any other), nor is it essential that it should be heated externally. To prevent loss of steam it is, however, desirable to surround the still with a wood or other non-conducting casing. A steam-pipe connected with a boiler producing steam of sufficient pressure to overcome the weight of the column of petroleum through which it has to pass, enters the still through a steam-tight joint and proceeds to within an inch or two of the bottom of the still, here the open end of the steam-pipe either terminates or ends in a perforated coil-pipe supported parallel with the bottom of the still. The still is provided with several gauge cocks for the purpose of ascertaining the height of the fluid from time to time, as it increases with the gradual condensation of a part of the steam, and it should also be provided with a draw-off cock or valve for the abstraction of this condensed water; this must not be allowed to run to waste until the small quantity of petroleum which comes away with it, frequently as a fine powder diffused through it, has risen to the top. The first action of the steam is the heating of the fluid

which gives off vapours of volatile hydrocarbons before the tar has attained the temperature of 212 degrees Fahrenheit, so that the first distillate contains little or no water, but this gradually increases in quantity, the steam serving as a vehicle for conveying the oily vapour to the refrigerator, until at last the oil comes over very slowly. It is better to stop this first part of the distillation so soon as the oils have diminished to one-sixth part of the distillate which runs into the receiver. As the oils which distil over are lighter than water, the distillate is allowed to flow into a separating vessel which allows of the water running from the bottom, thence into a second and third, so as to prevent loss of the oily products. These oils are collected fractionally or according to their respective volatility, the operator judging of this by the speed at which the distillation takes place under like circumstances; the first portions are nearly colourless when the operation is conducted carefully.

In order to purify the various distillates thus obtained they are subjected two or more times to fractional distillation with the aid of steam, collecting the distillate of each distillation in separate portions, which are each distilled separately and the products collected fractionally. The last distillates thus obtained should have their respective boiling limits ascertained, and those of like boiling points may now be mixed together.

The residue of the petroleum, after having been subjected to the action of low-pressure steam, is transferred into an iron still set in brickwork, which should cover the still up to the point of juncture with the refrigerator. The still is heated by means of an ordinary furnace, and is furnished also with a steam-pipe which passes into it and proceeds to within a few inches of the bottom. This steam-pipe is in connexion with a coil of pipes heated in a furnace and communicating with a steam-boiler producing steam of sufficient pressure to overcome that of the column of fluid in the still. The still and coil of pipes towards the last part of the operation will have to be heated to between 600 and 700 degrees Fahrenheit, but the distillation is conducted at as low a temperature as possible, commencing at about 230 degrees Fahrenheit, and the heat of the coil of pipes and the still only gradually increased as may be found necessary. By means of the supersaturated steam, that is, steam heated by means of the coil of pipes

passing through the furnace above the temperature it would acquire in contact with the water in the boiler, the distillation of the naphtha is effected at a much lower temperature and with less decomposition than could be done if distilled without the aid of the supersaturated steam. The same result, namely, subjecting the tar to the action of supersaturated steam, would be obtained by either heating the boiler of the still only, or only the coil of pipes, but the arrangement described is preferable. The vapours which distil over are first made to pass into a refrigerator cooled by the surrounding air, and in which the chief products condensed are oils, and lastly into a refrigerator cooled by a current of cold water in which some oil and all the water are condensed, which are separated by a suitable apparatus.

Most of the products of this second part of the operation, which are collected fractionally, contain a solid crystallizable hydrocarbon which crystallizes from them, particularly in cold weather, and may be separated by filtration. The more volatile products, however, contain little or no solid hydrocarbon.

The various products obtained by the use of supersaturated steam, are first separately re-distilled by means of steam at or about 212 degrees, which will carry over from the first portions especially a large portion of oil, and then finally by means of supersaturated steam. By careful rectification in this way, the chief part of the solid hydrocarbon is retained in the still, and comes over with the last products, and may be separated by filtration. The solid substance thus obtained, is first subjected to cold pressure, and then to hot pressure, between layers of horse-hair cloth, as is practised with the fatty acids, and in candle-making; then heated to 212 degrees Fahrenheit, with a fourth of its weight of oil of vitriol; it is now washed with water, then with alkali, and again distilled and pressed. Thus purified, it is white and diaphanous, and is fit for the manufacture of candles, or as an unguent to replace tallow.

The principal part of the oils are obtained colourless, except the latter products, which have a pale yellow tint. As some of the oils obtained have very high boiling points, they cannot on this account be burned without a wick, but are very valuable for the fuel of such lamps as are used for camphine, and their difficult ignitibility prevents the danger in use which attends such inflammable compounds as turpentine or camphine. From the high boiling point and

consequent fixity of these products they are extremely valuable as lubricators of machinery.

When the object is not to prevent the partial decomposition of the solid hydrocarbon, instead of proceeding as above described, I sometimes after partial distillation of the naphtha, by means of low-pressure steam, place the residue in a shallow still, heated by means of a naked fire, which should play as much over the still as possible, this still must be furnished with an alembic head, and protected by brickwork up to the point where it enters this head. This arrangement is necessary, on account of the facility with which the distillate condenses and runs back again into the still, but the gutter channel within the alembic head prevents this, the condensed fluid flowing into the neck and thence to the refrigerator. To effect the entire distillation by this apparatus, it has at last to be raised to a temperature approaching a red heat, and there is left a small residue of carbonaceous matter. In this mode of procedure some of the solid hydrocarbon becomes converted into oily fluids of very high boiling points. All the products obtained by distillation with a naked fire, I subsequently purify by distillation with the aid of steam as previously described.

By proceeding as before described, a series of oils are obtained, which have boiling points, progressively rising from a temperature below 200 degrees Fahrenheit, to above 600 degrees Fahrenheit, and even approaching a low red heat. The complete separation of the constituent hydrocarbons or oils is attended with much difficulty, as one volatilizes in the vapour of the other, and for commercial purposes it is not necessary to effect a perfect separation, I therefore confine myself usually to grouping the distillates by the range of temperatures, between which they boil. By distilling with the aid of a thermometer, and stopping the distillation at certain points, I sometimes effect a further purification, and by agitating the more volatile oils with a fourth part of their weight of oil of vitriol, and then washing first with water and afterwards with an alkaline solution, I obtain on redistillation a still further purification.

What I claim is, the preparation of various solid and fluid hydrocarbons from Burmese or other natural naphtha, petroleum, or tars, in the manner described, and their application when so prepared to the purposes of illumination, manufactures, and lubrication; also for the employment

of low-pressure steam, and afterwards supersaturated steam to the distillation of similar native compounds.—In witness, &c.

WARREN DE LA RUE.

Specification of the Patent granted to HIRAM TUCKER, *of the State of Massachusetts, of the United States of America, for an Improvement in the Art or Process of applying Colours to a Surface by means of a Liquid.*—Dated September 24, 1853.

To all to whom these presents shall come, &c., &c.—My invention is based on a very important discovery which I have made, in the art of applying colours to surfaces by means of a bath of water or other proper liquid.

In the common process of "marbling," as it is termed by the manufacturers of "marbled paper," a size bath is employed, and the colours or pigments are mixed with water, which admits of their being floated on the surface of the bath when thrown in the same.

The object of using mucilage or matter of such kind soluble in water, is not only to hold up the colours, but to enable them to be applied to paper, and to shortly dry them, the surface of paper to receive the colour being laid on the colours while they are floating on the bath. Attempts to employ colours mixed with oil have been attended with certain difficulties. In the first place, the oil by its very fluent properties will cause the colours to "run together," or stand in drops, or so combine when on the surface of the liquid as to spoil the effect desired. In the second place, should this not take place in the bath, it will be very likely to occur after the application of the colours to the paper, and before they can become dry. In the third place, the oil of itself is not sufficiently siccative even when boiled. These practical difficulties, as well as others which might be stated, and which are known to persons skilled in the art of "marbling," have prevented the employment of drying oils as vehicles for colours in the process of colouring by the bath. Besides this they have prevented the use of water alone in the bath, the liquid generally used being a strong solution of gum tragacanth, or a strong size made of parchment clippings.

Most oils are so fluent, that a single drop or goutte of a tenth of an inch in diameter would readily and almost immediately flow over a surface of one or two feet in diameter; in fact, but a very short period of time is required for it to flow over the whole surface of the bath, and should there be any colours on it they will all be driven in a body before it.

It is sometimes customary, particularly in what is termed "shell marbling," by means of a size bath, to put into a pint of the mixture of water and colour a drop or two of some drying oil. This minute quantity of oil, when the colour is spattered on the surface of the bath, will prevent it in a great measure from combining with or laying on the other colours, and will separate or drive them before it, so as to produce the "shell" appearance known to workmen.

By my improvement I use a water bath instead of a size bath. The fluent, or some other property of linseed or drying oil, prevents it from being used alone as a vehicle for the pigments when employed in the marbling process. In colouring the surfaces of objects made of slate, iron, papier maché, or various other materials, it becomes desirable to use oil colours, owing to the great facility with which they may be worked or controlled, in attempts to produce with them perfect resemblances of whatever we may desire to imitate.

I have therefore sought for some substance which, when combined with the linseed or drying oil used, would sufficiently overcome the fluent property of it, or so change it as to enable the colours mixed with the oil and such substance to remain broken up and not combine together after being broken up on the surface of the water bath or with colours thrown on or between them when on said surface. In my researches I have made the discovery that the gum resin from the "Dammara australis," or "Pinus kauri," and which is known in commerce by the names of kauri or cowdee or dammar, or dammara, when mixed with a suitable vehicle, such as the essential oil of turpentine, for instance, will combine with a drying oil, and impart to it not only that property so desirable for the marbling process, but it will give to the oil a body and siccative properties of great advantage to oil colours applied by such means. The solution of the resinous gum and the essential oil may be from two or three pounds of the gum to a gallon of the essential oil, although I do not confine my process to such

proportions, as I find the varnish made from the cowdee will serve a very good purpose.

To a quart of the drying oil I usually put about two quarts of the cowdee solution or varnish, not, however, confining myself to such proportions, as the graining colours will often require or work well with a very much less proportion of the kauri or dammar varnish, and mix up with the mixture the various colours to be used, and to the consistence that may be desirable. With these colours so prepared, I first throw or lay on the surface of the water in the bath a small quantity of what may be deemed the ground colour, and I suffer it to spread over the surface of the bath. This will take place in about one-half a minute, and the colour will gradually dry or set so that if a stick is run through it, so as to break it up, it will not combine or run together again as drops of oil or water do when brought in contact. Into the mass of colour thus broken up, I throw or spread or interlay the veining or other colours; and this may be effected by dipping the breaking-up stick or article used, into the veining colour, and moving it, and the veining colour on it, around in the thin stratum of ground colour so as not only to break up or separate in pieces or parts, the stratum of ground colour, but at the same time lay the veining colour between such pieces or portions so as to cause it to embrace and separate them, somewhat as vein colours in marble do other colours thereof. Next, by means of a stick or thin spatula, or blade dipped into the water, I float all the masses of veining and ground colour up together, so as to bring those of the veining and ground colours in contact to the extent that may be desired to form the figure. On completion of this, the piece of stone or the article to be marbled or coloured, is to be dipped into the water and laid on the colours floating on the surface thereof, and immediately removed therefrom, the colours by such operation being made to leave the water and adhere to the dipped surface of the article. When they are dried thereon, which shortly takes place, they may be rubbed or ground down and polished, the figure made by their combination having, to a wonderful extent, the natural appearance of the marble or such veined or variegated stone that it may be intended to imitate. Neither the kauri or dammar varnish, nor the linseed or drying oil, can be used alone and produce the effect that results from their combination and employment as stated.

I do not claim the common process of applying water colours to paper by the use of a bath of size, and mixing such colours in water, nor do I claim the union of linseed-oil and varnish made from kauri in its use in connexion with a pigment, and in the common process of painting or spreading colours on a surface by means of a brush, my invention having special reference to the application of colours to a surface by means of a liquid or water bath, nor do I claim therein the use of either kauri or oil alone.

What I claim is, my improvement in the process of marbling, whereby an oil colour (or pigment mixed with a drying oil) when applied to or spread on a surface of a bath of water or other suitable liquid shall have imparted to it the property above mentioned; my said improvement consisting in employing in such process the gum kauri (or a like substance) combined, as specified, with the drying oil, the same enabling a person by means of a bath to apply to a surface of stone or other material, oil colours, so as to present the natural effects or appearance of any polished stone that it may be desired to imitate.

I also claim the above-described method of breaking up the stratum of ground colour on the bath, into masses of various sizes, and laying the veining colours among them, the same consisting in using the veining colour, as described, on the breaking-up stick or article, during or in combination with the process of breaking up the ground colours, as stated, the veining colour by such means being made to accurately follow and be deposited in the path of the breaking-up stick, as well as in lateral directions between the masses.—In witness, &c.

HIRAM TUCKER.

Specification of the Patent granted to STEPHEN GARRETT, *of No.* 16, *Taunton-place, Crimscott-street, Grange-road, Bermondsey, in the County of Surrey, Currier, for Improvements in the Preparing and Tanning of Skins, Hides, or Pelts of Animals.*—Dated May 14, 1853.

To all to whom these presents shall come, &c., &c.—My said invention consists of a mode or modes of subjecting skins, hides, or pelts of animals to the action of any

solutions or liquids by which they are intended to be operated upon for converting them into leather of any description, or otherwise preserving them, by using or applying mechanical action, in manner hereinafter described, for the purpose of subjecting the skins, hides, or pelts more effectually to the action of the liquid by which they are to be operated upon, and also for the purpose of causing such action to be accelerated or increased. For this purpose I suspend the skins, hides, or pelts upon the poles or bars of a frame, which can be easily introduced into the pit or tank containing the lime water, the solution of tan, or other liquid, to the action of which the skins, hides, or pelts are to be subjected; the skins, hides, or pelts being suspended in such a manner that their surfaces shall not touch each other.

The pit or tank being sufficiently charged with the liquid which is to operate upon the skins, hides, or pelts, I cause the frame with the skins, hides, or pelts upon it, to be immersed in the liquid contained in the pit or tank, and after being so immersed for some time, I draw the frame, with all the skins, hides, or pelts upon it, entirely out of the pit or tank, and then again proceed to immerse the frame, with all the skins, hides, or pelts upon it, in the liquid contained in the pit or tank, and again withdraw it as before. And I continue alternately to immerse the skins, hides, or pelts, and to withdraw them from the pit or tank, as already mentioned; and I keep up this mechanical action continuously, or nearly so, during the process, for the purpose of subjecting the skins, hides, or pelts more effectually to the action of the liquid, and also causing such action to be accelerated or increased.

This mode of treating skins, hides, or pelts is applicable to the ordinary liming and tanning processes, and also to other processes for converting the skins, hides, or pelts into leather, or otherwise treating them.

I do not, however, intend to claim the alternately immersing and withdrawing skins, hides, and pelts into and from solutions, unless the same shall be effected by the means hereinafter described.

For the purpose of producing and keeping up this mechanical action with greater facility, I use machinery or apparatus by means of which the skins, hides, or pelts, during the process of tanning or otherwise preparing them,

are alternately immersed in and withdrawn from the liquid to the action of which they are to be subjected.

This machinery or apparatus consists of a series of levers, beams, or arms, by means of which the frames holding the skins, hides, or pelts may be immersed in and withdrawn from a solution from time to time for the purposes above mentioned, the frame containing the skins, hides, or pelts to be operated upon in one pit or tank acting as a counterbalance weight to the skins, hides, or pelts to be operated upon in another pit or tank.

The levers, beams, or arms which produce these effects are mounted centres or pins at or near to the middle parts thereof, and they have motion given to them by machinery actuated by steam, animal, or other motive power, so that the opposite ends of each lever, beam, or arm shall be alternately depressed and raised for the purpose of alternately immersing and withdrawing the skins, hides, or pelts from the pits, the frame containing the skins, hides, or pelts in one pit being suspended to the end of one lever or beam, or to one end of each of a series of levers or beams; the frame containing the skins, hides, or pelts in another and nearly adjoining pit being suspended to the other end or ends of the lever or beam, levers or beams.

By reason of one frame acting as a counterbalance to the other, the amount of mechanical power necessary for the purpose of alternately depressing and raising the levers or beams will be considerably diminished.

Any convenient means of communicating motion to the levers or arms may be adopted, the precise arrangement of mechanism used being immaterial.

Instead of alternately immersing and withdrawing the skins, hides, or pelts into and from any liquor by which they are intended to be operated upon in manner hereinbefore described, I sometimes cause them to be moved backwards and forwards in a horizontal direction within the tank or vessel, and in the liquor in which they are suspended, preferring to apply the motion in such a direction that the skins, hides, or pelts will move edgeways through the liquor, and the liquor be thus caused to pass through between the skins and against their surfaces.

Any convenient machinery which will give alternating horizontal motions to the frame upon which the said skins, hides, or pelts are suspended may be applied to the frame,

so as to cause such alternating motions to be applied continuously, or at such intervals and at such speed as may be desired.—In witness, &c.

STEPHEN GARRETT.

PATENTS SEALED TO FEBRUARY 22, 1854.

1766. PETER ARMAND LECOMTE DE FONTAINEMOREAU, of South-street, Finsbury, in the county of Middlesex, for Certain improvements in the manufacture of tiles for roofing.—Dated July 27, 1853. Sealed January 27, 1854.—(A communication.)

1768. EDWARD HERRING, of Southwark, in the county of Surrey, Manufacturing Chemist, for Improvements in the manufacture of sulphate of quinine.—Dated July 28, 1853. Sealed January 27, 1854.

1771. THOMAS FORSTER, of Streatham, in the county of Surrey, for Improvements in the manufacture of boots and shoes.—Dated July 28, 1853. Sealed January 27, 1854.

1820. WILLIAM HICKSON, of Carlisle, Gentleman, for Improvements in canal and river navigation, and in vessels to be used in such navigation, and in the mode of propelling the same.—Dated August 4, 1853. Sealed January 27, 1854.

1823. CHARLES BUTLER CLOUGH, of Tyddyn, in the county of Flint, for improvements in machinery or apparatus for washing, scouring, cleansing, or steaming woven fabrics, either in the piece or garment, also felts or fibrous substances, and corn, roots, seeds, or similar matters.—Dated August 4, 1853. Sealed January 27, 1854.

1826. BARTHELEMY LOUIS FRANÇOIS XAVIER FLECHELLE, Gentleman, of Paris, for Certain improvements in the means of carrying, bedding, and bathing the injured, ill, or invalid persons.—Dated August 4, 1853. Sealed January 27, 1854.

1835. JAMES LEE NORTON, of Holland-street, Blackfriars, in the county of Surrey, for Improvements in obtaining wool from fabrics in a condition to be again used.—Dated August 5, 1853. Sealed January 27, 1854.

1850. THOMAS YOUNG HALL, of Newcastle-upon-Tyne, Coal-owner, for Improvements in combining glass with other materials.—Dated August 9, 1853. Sealed January 27, 1854.

1869. THOMAS KELLEY HALL, of Crewe, in the county of Chester, Smith, for Certain improvements in forge hammers.—Dated August 11, 1853. Sealed January 27, 1854.

1891. WILLIAM ALDRED, of Manchester, Bleacher, RICHARD FENTON, of Prestwich, Waste-dealer, and WILLIAM CRONE, of Salford, Rent-dealer, for Certain improvements in separating or recovering the wool from cotton and woollen or other similar mixed fabrics, whereby the wool is rendered capable of being again employed.—Dated August 12, 1853. Sealed January 27, 1854.

1940. FREDERICK WILLIAM DE FABECK, of Portland-road, in the county of Middlesex, for the construction of viaducts, bridges, lintels, beams, girders, and other horizontal structures and supports.—Dated August 10, 1853. Sealed January 27, 1854.

1985. RICHARD ROBERTS, of Manchester, Engineer, for Improvements in the construction of casks and other vessels.—Dated August 27, 1853. Sealed January 27, 1854.

2076. MICHAEL LEOPOLD PARNELL, of the Strand, Lock Manufacturer, for Improvements in the construction of locks.—Dated September 9, 1853. Sealed January 27, 1854.

2167. HENRY CONSTANTINE JENNINGS, of Great Tower-street, in the City of London, for Improvements in treating and bleaching resinous substances.—Dated September 17, 1853. Sealed January 27, 1854.

2290. CHARLES AUGUSTUS HOLM, of Cecil-street, in the county of Middlesex, Civil Engineer, for Improvements in machinery for raising or propelling elastic and non-elastic fluids.—Dated October 6, 1853. Sealed January 27, 1854.

2467. WESTON GRIMSHAW, of Mossley, county Antrim, Ireland, for Improvements in steam boilers.—Dated October 25, 1853. Sealed January 27, 1854.

2486. GEORGE EDWARD DERING, of Lockleys, in the county of Hertford, for Improvements in galvanic batteries.—Dated October 27, 1853. Sealed January 27, 1854.

2612. JAMES WILLIS, of Wallingford, in the county of Berks, Harness Maker, for Improvements in buckles.—Dated November 11, 1853. Sealed January 27, 1854.

2643. CHARLES EMILIUS BLANK, of Trump-street, in the city of London, Merchant, for Improvements in winding yarn into hanks.—Dated November 15, 1853. Sealed January 27, 1854.—(A communication.)

2683. PATRICK BENIGNUS O'NEILL, of Paris, for An improvement in the manufacture of perforated buttons.—Dated November 18, 1853. Sealed January 27, 1854.—(A communication.)

2737. SAMUEL CUNLIFFE LISTER, of Manningham, Bradford, in the county of York, Manufacturer, for Improvements in combing wool, cotton, and other fibrous material.—Dated November 24, 1853. Sealed January 27, 1854.

2739. WILLIAM JONES, of Kilney Cottage, Swansea, for Improvements in the manufacture of bricks.—Dated November 24, 1853. Sealed January 27, 1854.

2743. JOHN BERRY, of Manchester, Manchester Warehouseman, for Improvements in the machinery or apparatus for manufacturing wire fencing.—Dated November 25, 1853. Sealed January 27, 1854.

2744. WILLIAM CALDER, of Glasgow, Manager, for Improvements in the treatment and finishing of threads or yarns.—Dated November 25, 1853. Sealed January 27, 1854.

2805. GEORGE WILLIAMSON, of Glasgow, Manufacturer, for Improvements in applying motive power.—Dated December 2, 1853. Sealed January 27, 1854.

2807. JOHN CHARLES WILSON, of Redford Flax Factory, Thornton, Kircaldy, North Britain, for Improvements in machinery for scutching flax, hemp, and other fibrous materials.—Dated December 2, 1853. Sealed January 27, 1854.

2811. HENRY BESSEMER, of Baxter House, Old St. Pancras-road, in the county of Middlesex, Engineer, for Improvements in the manufacture and refining of sugar.—Dated December 2, 1853. Sealed January 27, 1854.

2854. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improved machinery for drilling or boring rocks and other hard substances.—Dated December 8, 1853. Sealed January 27, 1854.—(A communication.)

1777. WILLIAM EDWARD NEWTON, of Chancery-lane, in the county of Middlesex, Civil Engineer, for Improvements in depositing metals or alloys of metals.—Dated July 29, 1853. Sealed January 28, 1854. —(A communication.)

1779. WILLIAM THOMAS HENLEY, of St. John-street-road, London, Telegraph Engineer, for Improvements in modes of protecting wires for telegraphs.—Dated July 30, 1853. Sealed January 30, 1854.

1879. LOUIS VAN CANEGHEM, of Conduit-street, in the county of Middlesex, Steel Busk Manufacturer, for Improvements in fastening corsets by a mechanical hook.—Dated August 12, 1853. Sealed January 30, 1854.

1948. WILLIAM VAUGHAN, of Stockport, in the county of Chester, Gentleman, and JOHN SCATTERGOOD, of Heaton Norris, in the county of Lancaster, Machinist, for Certain improvements in machinery, apparatus, or implements for weaving.—Dated August 20, 1853. Sealed January 30, 1854.

1953. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, London, for Improvements in the manufacture of certain mineral oils and paraffine.—Dated August 22, 1853. Sealed January 30, 1854.—(A communication.)

2029. JOHN TAYLER, of Manchester, Engineer, JAMES GRIFFITHS, of Wolverhampton, Engineer, and THOMAS LEES, of Stockport, Machinist, for Certain improvements in steam-boilers, and in apparatus applicable thereto, and to be used therewith.—Dated September 2, 1853. Sealed January 30, 1854.

2232. JAMES GRIFFITHS, of Wolverhampton, Engineer, for Certain improvements in steam-engines.—Dated September 29, 1853. Sealed January 30, 1854.

1788. JOHN SMEETON, of Limehouse, in the county of Middlesex, Export Outfitter, &c., for Improvements in the manufacture of tablets and dial plates applicable to showing the distances of carriages travelling, barometers, compasses, and time-pieces.—Dated August 1, 1853. Sealed February 1, 1854.

1806. ANTOINE JOSEPH QUINCHE, of Paris, for An improved apparatus for measuring distances travelled over by vehicles.—Dated August 2, 1853. Sealed February 1, 1854.

1843. ROBERT MORRISON, of Newcastle-upon-Tyne, Engineer, for Improvements in apparatus for forging, shaping, and crushing iron and other materials, and for driving piles.—Dated August 6, 1853. Sealed February 1, 1854.

1868. THOMAS DEWSNUP, of Manchester, Stay and Corset Manufacturer, for Improvements in obtaining motive power.—Dated August 11, 1853. Sealed February 1, 1854.

2207. CHARLES MAITLAND, of Alloa, in the county of Clackmannan, North Britain, Brewer, and WILLIAM GORRIE, of Rosemains, Cranston, in the county of Midlothian, North Britain, Factor, for Improvements in apparatus for heating water or other liquids.—Dated September 24, 1853. Sealed February 1, 1854.

2224. JOSEPH FERMONT VAN WARMERDAM, of Lokeren, in the

kingdom of Belgium, for The improved manufacture of artificial vinegar.—Dated September 28, 1853. Sealed February 1, 1854.

2308. GEORGE LIFFORD SMARTT, of Enfield, in the county of Middlesex, Chemist, for Improvements in vessels for preserving leeches and fish alive.—Dated October 8, 1853. Sealed February 1, 1854.

2615. JOHN PLATT, of Oldham, in the county of Lancaster, Machinist, for Certain improvements in apparatus or machines for forging, drawing, moulding, or forming spindles, rollers, bolts, and various other articles in metal.—Dated November 11, 1853. Sealed February 1, 1854.

2639. WILLIAM SMITH, of Manchline, in the county of Ayr, North Britain, Gentleman, for Improvements in ruling ornamental figures.—Dated November 14, 1853. Sealed February 1, 1854.

2678. AMEDEE FRANÇOIS REMOND, of Birmingham, Gentleman, for Improvement or improvements in the construction of steam-boilers or generators. — Dated November 18, 1853. Sealed February 1, 1854.

2723. JOHN HILL, senior, and JOHN HILL, junior, both of Manchester, Machine Makers, for Improvements in machinery for winding, doubling, and spinning silk.—Dated November 23, 1853. Sealed February 1, 1854.

2745. WILLIAM LEIGH BROOK, of Meltham Mills, near Huddersfield, York, Cotton Spinner, and CHARLES BROOK, junior, of the same place, Cotton Spinner, for Certain improvements in preparing, dressing, finishing, and winding cotton, and linen yarns or threads, and in the machinery or apparatus connected therewith. — Dated November 25, 1853. Sealed February 1, 1854.

2757. JOSEPH STENSON, of Northampton, Civil Engineer and Iron Manufacturer, for Improvements in the manufacture of iron.—Dated November 26, 1853. Sealed February 1, 1854.

2765. JOSEPH MICHEL HENRI PERODEAUD, Civil Engineer, of Paris, for An improved mode of treating peat, for the conversion of the same into an artificial coal, which may be used in that state or afterwards reduced to coke. — Dated November 26, 1853. Sealed February 1, 1854.

2815. CHARLES BUCK, of Wellington, in the county of Somersetshire, Gentleman, for An improved apparatus for retarding or stopping the progress of wheel carriages.—Dated December 3, 1853. Sealed February 1, 1854.

2823. MATTHEW ANDREW MUIR, of Glasgow, Machinist, for Improvements in check and fancy weaving.—Dated December 5, 1853. Sealed February 1, 1854.

2835. ROBERT CHRISTOPHER WITTY, of Portland-place, Wandsworth-road, Surrey, Engineer, for Improvements in the construction of boiler and other furnaces.—Dated December 6, 1853. Sealed February 1, 1854.

2843. JOHN GETTY, of Liverpool, Ship Builder, for Improvements applicable to the plating of iron ships, part of which improvements is also applicable to the construction of boilers.—Dated December 7, 1853. Sealed February 1, 1854.

2851. JOSEPH ROBINSON, of Denton Mill, Carlisle, for Improvements in mills for grinding corn and other substances.—Dated December 8, 1853. Sealed February 1, 1854.

2875. HENRY BESSEMER, of Baxter House, Old Saint Pancras-road, in the county of Middlesex, Engineer, for Improvements in the construction of railway axles and brakes.—Dated December 9, 1853. Sealed February 1, 1854.

1802. WILLIAM PERKS, junior, of Birmingham, Glass and Lead Merchant, for A new or improved tap for drawing off liquids.—Dated August 2, 1853. Sealed February 2, 1854.

1804. WILLIAM HENRY CLARKE, of Great Marlborough-street, in the county of Middlesex, Peat and Manure Merchant, for Improvements in the manufacture of a composition resembling papier maché and carton pierre, and applicable to the same purposes to which papier maché and carton pierre are applied, parts of which invention may also be applied to the construction of ships and boats, and roofing.—Dated August 2, 1853. Sealed February 2, 1854.—(A communication.)

1811. JOSEPH CLISILD DANIELL, of Bath, for An improvement or improvements in preparing food and litter for cattle, pigs, and other animals.—Dated August 3, 1853. Sealed February 3, 1854.

1821. CHARLES HILL SNELL, of the Triangle, Hackney, in the county of Middlesex, Chemist, for Improvements in the manufacture of soap.—Dated August 4, 1853. Sealed February 3, 1854.

1828. JOSEPH LALLEMAND, of Besançon, in the Empire of France, Chemist, for The manufacture of paper from peat.—Dated August 5, 1853. Sealed February 3, 1854.

1831. WILLIAM SMITH and THOMAS PHILLIPS, of Snow-hill, in the county of Middlesex, Gas Engineers, for An improvement in gas stoves.—Dated August 5, 1853. Sealed February 3, 1854.

1946. JEAN BAPTISTE POLAILLON, Gentleman, and FRANÇOIS MAILLARD, Starch Manufacturer, both of Lyons, in the Empire of France, for Improvements in the manufacture of starch.—Dated August 20, 1853. Sealed February 3, 1854.

2567. WILLIAM FOSTER, of Lister-place, Bradford, York, Manufacturer, for Improvements in looms for weaving.—Dated November 4, 1853. Sealed February 3, 1854.

2649. PETER ALEXANDER HALKETT, of the Albany, in the county of Middlesex, Lieutenant in the Royal Navy, for Improvements in apparatus for lifting and lowering ships and other heavy bodies, either submerged or otherwise.—Dated November 16, 1853. Sealed February 3, 1854.

1841. RICHARD BARTHOLOMEW MARTIN, of Suffolk-street, Haymarket, London, for An improved plate-warmer.—Dated August 6, 1853. Sealed February 6, 1854.

2257. JAMES LEADBETTER, of Halifax, York, Brazier, and WILLIAM WRIGHT, of the same place, Plumber, for Improvements in machinery or apparatus for raising fluid and solid substances.—Dated October 3, 1853. Sealed February 6, 1854.

2302. ALEXANDER EDWARD DUDLEY KNOX ARCHER, of Wharf-road, City-road, for Improvements in apparatus for applying metallic capsules.—Dated October 6, 1853. Sealed February 6, 1854.

2317. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall, Managing Director of Price's Patent Candle Company, for Improvements in the manufacture of candle and night-lights.—Dated October 10, 1853. Sealed February 6, 1854.

2483. THOMAS SEAL BLACKWELL, of Cranbrook, in the county of

Kent, Surgeon, for Improvements in apparatus for signalizing and stopping railway trains.—Dated October 27, 1853. Sealed February 6, 1854.

2826. JAMES ROBERTSON, of Kentish-town, in the county of Middlesex, Cooper, for Improvements in the consumption or prevention of smoke.—Dated December 5, 1853. Sealed February 6, 1854.

2860. ARTHUR JAMES, of Redditch, in the county of Worcester, Manufacturer, for Improvements in counting, measuring, and weighing needles, and in preparing papers to receive the same.—Dated December 9, 1853. Sealed February 6, 1854.

2863. CHARLES MACKENZIE, of Bayswater, in the county of Middlesex, Esquire, and ALEXANDER TURNBULL, of Manchester-square, in the county of Middlesex, Doctor of Medicine, for Machinery for paring fruit and vegetables.—Dated December 9, 1853. Sealed February 6, 1854.—(A communication.)

2868. JOHN CHISHOLM, of Holloway, in the county of Middlesex, Practical Chemist, for Improvements in the distillation of organic substances, and in obtaining products therefrom.—Dated December 9, 1853. Sealed February 6, 1854.

2896. FREDERICK ALBERT GATTY, of Accrington, in the county of Lancaster, Manufacturing Chemist, and EMILE KOPP, of Accrington aforesaid, Professor of Chemistry, for Improvements in printing and dyeing cotton, wool, silk, and other fibrous substances.—Dated December 14, 1853. Sealed February 6, 1854.

2916. ALEXANDER COCHRAN, of Kirkton Bleach Works, in the county of Renfrew, North Britain, Bleacher, for Improvements in the application of starch or other substances of a similar nature to woven fabrics, and in the machinery or apparatus employed therein.—Dated December 15, 1853. Sealed February 6, 1854.

1865. DAVID MUSHET, of Coleford, in the county of Gloucester, Gentleman, and EDWIN WHELE, of Shiffnal, in the county of Salop, Engineer, for Improvements in propelling steam-vessels or other vessels.—Dated August 10, 1853. Sealed February 8, 1854.

1883. READ HOLLIDAY, of Huddersfield, in the county of York, for Improvements in lamps, and in lanterns used therewith.—Dated August 12, 1853. Sealed February 8, 1854.

1951. SAMUEL LOMAS, of Manchester, Manager, for An improved silk cleaner.—Dated August 22, 1853. Sealed February 8, 1854.

2513. JOHN GRAY, of Dublin, Medical Doctor, for A self-acting flushing apparatus applicable to sanitary purposes.—Dated October 31, 1853. Sealed February 8, 1854.

1860. JEAN PIERRE ALBERT GALIBERT, of Paris, Doctor of Medicine, for An improved domestic telegraph.—Dated August 10, 1853. Sealed February 10, 1854.

1889. THOMAS ALLAN, of Adelphi-terrace, in the city of Westminster, Civil Engineer, for Improvements in electric conductors and in the means of insulating electric conductors.—Dated August 12, 1853. Sealed February 10, 1854.

1931. DAVID HARKES, of Mere, in the county of Chester, for Improvements in machinery or apparatus for mowing, reaping, or other similar purposes.—Dated August 18, 1853. Sealed February 10, 1854.

1977. WILLIAM AUSTIN, of Holywell-street, Westminster, for Improvements in the manufacture of blocks of plastic materials for

building purposes.—Dated August 25, 1853. Sealed February 10, 1854.

1867. JOSEPH BACON FINNEMORE, of Easy-row, Birmingham, Manufacturer, and EDWIN DANIEL CHATTAWAY, of Birmingham, Architect, for Improvements in apparatus for ascertaining or registering the number of persons travelling by omnibuses or other vehicles, or who may have entered in or passed by, out of, or through any particular place, vehicle, or building, during any given period.—Dated August 11, 1853. Sealed February 11, 1854.

1878. SAMUEL ADAMS, of West Bromwich, in the county of Stafford, Manufacturer, for A new or improved apparatus for regulating the supply of water to steam and other boilers, applicable also to regulating the supply of liquids to vessels and reservoirs in general. —Dated August 12, 1853. Sealed February 11, 1854.

1880. JAMES STRONG, of Smethwick, in the county of Stafford, Engineer, for Improvements in furnaces for smelting iron-stone and ores.—Dated August 12, 1853. Sealed February 11, 1854.

1881. THOMAS TURNER, and JOHN FIELD SWINBURN, both of Birmingham, Gun Manufacturers, for Improvements in sights for rifles.—Dated August 12, 1853. Sealed February 11, 1854.

1887. RICHARD ARCHIBALD BROOMAN, of Fleet-street, in the city of London, for A method of producing castings in malleable iron.—Dated August 12, 1853. Sealed February 11, 1854.—(A communication.)

1888. WILLIAM LITTELL TIZARD, of Aldgate, in the city of London, Brewers' Engineer, for A new combination or new combinations of materials suitable for buildings and other structures and parts thereof, and machinery for producing the same.—Dated August 12, 1853. Sealed February 11, 1854.

1895. FREDERICK LIPSCOMBE, of the Strand, in the county of Middlesex, Water Filter Manufacturer, for Improvements in evaporating.—Dated August 13, 1853. Sealed February 13, 1854.

1900. JOHN GWYNNE, of Essex Wharf, Strand, in the county of Middlesex, Gentleman, for Improvements in the preparation of a black powder from coal, and the application thereof to the manufacture of paints, blacking, and various other purposes.—Dated August 13, 1853. Sealed February 13, 1854.

1902. JOHN GWYNNE, of Essex Wharf, Strand, in the county of Middlesex, Gentleman, and JAMES EGLESON ANDERSON GWYNNE, of the same place, Engineer, for Improvements in the preparation of beet root for the manufacture of sugar, which improvements are also applicable to the preparation of other vegetables.—Dated August 13, 1853. Sealed February 13, 1854.

1906. HESKETH HUGHES, of Cottage-place, in the county of Middlesex, Engineer, for An improved method of producing cut and fancy patterns in velvets, silks, and other textile fabrics.—Dated August 13, 1853. Sealed February 13, 1854.

2037. THOMAS WALKER, of Birmingham, Engineer, for Improvements in rotary engines to be worked by steam or other fluid.—Dated September 3, 1853. Sealed February 13, 1854.

2202. JAMES GRAFTON JONES, of Islington, in the county of Middlesex, Engineer, for Certain improvements in the means of conveying signals or intelligence from one part of a railway train to another.—Dated September 24, 1853. Sealed February 13, 1854.

2514. GEORGE HAMILTON, of Paisley, Bleacher, for Improvements in spreading or distributing starch, gum, and other semi-fluid matters. —Dated October 31, 1853. Sealed February 13, 1854.

2726. JAMES DILKS, of Parliament-street, Nottingham, Lithographer and Embosser, for Improvements in bands for binding more effectually than heretofore packets or parcels of lace and other articles. —Dated November 23, 1853. Sealed February 13, 1854.

2825. THOMAS STOREY, of the Phœnix Foundry, Lancaster, Engineer, for Improvements in the construction and arrangement of apparatus employed in connexion with sewers.—Dated December 5, 1853. Sealed February 13, 1854.

2848. BENJAMIN SOLOMONS, of Albemarle-street, Piccadilly, in the county of Middlesex, Optician, for Improvements in telescope and other glasses, in their application to the measurement of distance. —Dated December 8, 1853. Sealed February 13, 1854.

2906. SAMUEL MESSENGER, of Birmingham, Manufacturer, for An improvement or improvements in railway, ship, and carriage lamps.—Dated December 15, 1853. Sealed February 13, 1854.

1916. JOHN ATHERTON, of Preston, Machine Maker, and JAMES ABBOTT, of Accrington, Cotton Spinner, for Certain improvements in and applicable to machines for winding yarn or thread called "winding machines," used in the manufacture of cotton and other fibrous substances.—Dated August 16, 1853. Sealed February 16, 1854.

1917. PETER FOXCROFT, of Salford, in the county of Lancaster, Manager, for Certain improvements in machinery or apparatus for doubling cotton and other fibrous materials.—Dated August 16, 1853. Sealed February 16, 1854.

1918. GEORGE RICHARDSON, of the Eastern Counties Railway, Shoreditch, Civil Engineer, for Improvements in railway signals, and in the means of preventing accidents upon railways, and in the apparatus connected therewith.—Dated August 16, 1853. Sealed February 16, 1854.

1924. THOMAS CLARK OGDEN, of Manchester, Cotton-spinner, and WILLIAM GIBSON, of the same place, Manager, for Improvements in machinery or apparatus for preparing, doubling, and twisting cotton and other fibrous materials.—Dated August 17, 1853. Sealed February 17, 1854.

2886. THOMAS HOLLINSWORTH, of Winwick, near Warrington, Lancaster, Engineer, for Certain improvements in the method of applying breaks to carriages employed upon railways, and in the machinery or apparatus connected therewith.—Dated December 12, 1853. Sealed February 17, 1854.

2962. JAMES BURROWS, of Haigh Foundry, near Wigan, in the county of Lancaster, Engineer, for Certain improvements in the formation of such metallic plates as are required to be conjoined by rivetting or other similar fastening.—Dated December 20, 1853. Sealed February 17, 1854.

1926. THOMAS GRIMSLEY, of Oxford, Sculptor, for Improvements in machinery for the manufacture of bricks, tiles, pipes, and pottery.— Dated August 17, 1853. Sealed February 17, 1854.

2032. AUGUSTINO CAROSIO, of Genoa, Doctor of Medicine, for Improvements in obtaining power by the aid of an electric current for motive and telegraphic purposes.—Dated September 2, 1853. Sealed February 17, 1854.

1930. DAVID CHALMERS, of Manchester, Manufacturer, for Improvements in machinery or apparatus for mowing, reaping, or other similar purposes.—Dated August 18, 1853. Sealed February 18, 1854.

1932. ALEXIS PIGE, of Greek-street, Soho, in the county of Middlesex, Gentleman, for Improvements in locks and their keys.—Dated August 18, 1853. Sealed February 18, 1854.—(A communication.)

1937. WILLIAM CORNELIUS, of Panton-street, Haymarket, in the county of Middlesex, for Improvements in gilding porcelaine, glass, and such like materials.—Dated August 18, 1853. Sealed February 18, 1854.—(A communication.)

1938. AUGUSTE MATHIEU MAURICE DE BERGEVIN, of Paris, for Improvements in the manufacture of coke, and in the apparatus connected therewith, and in treating the products obtained therefrom.—Dated August 18, 1853. Sealed February 18, 1854.—(A communication.)

1944. JAMES KIMBERLEY, of Birmingham, Wholesale Ironmonger and Manufacturer, for An improvement or improvements in raising and lowering various kinds of window-blinds, and in opening and closing window and other curtains, applicable also to the raising and lowering, or winding and unwinding of maps and other sheets or articles, and to the closing of doors.—Dated August 20, 1853. Sealed February 20, 1854.

1968. GEORGE CULVERHOUSE, of Hull, for Improvements in manufacturing compost or manure.—Dated August 24, 1853. Sealed February 20, 1854.

2690. MOSES POOLE, of Avenue-road, Regent's-park, in the county of Middlesex, for Improvements in breech-loading fire-arms and in cartridges for use with such fire-arms.—Dated November 19, 1853. Sealed February 20, 1854.—(A communication.)

2871. WILLIAM SCHAEFFER, of Stanhope-terrace, in the county of Middlesex, Chemist, for Improvements in purifying spirit.—Dated December 9, 1853. Sealed February 20, 1854.

2930. SAMUEL SMITH, of Horton Dye Works, near Bradford, York, for Improvements in preparing rovings and yarns of wool.—Dated December 16, 1853. Sealed February 20, 1854.

2931. ALEXANDER PARKES, of Birmingham, for Improvements in separating silver from its ores or other compounds.—Dated December 16, 1853. Sealed February 20, 1854.

2940. CALEB BEDELLS, of Leicester, for Improvements in the manufacture of elastic fabrics.—Dated December 17, 1853. Sealed February 20, 1854.

2960. EMILE VICTOR FELIX LEMAIRE, of Paris, for Improvements in tanning.—Dated December 20, 1853. Sealed February 20, 1854.

2998. ALBERT NAGLES, of Ghent, Chemist, for Certain improvements in machinery or apparatus for washing, bleaching, dunging, and dyeing woven fabrics.—Dated September 3, 1853. Sealed February 20, 1854.

2901. JOHN WIDBERLEY, of Eagley, near Bolton, Lancaster, Mechanic, for Certain improvements in machinery or apparatus for winding yarns or threads on to spools or bobbins.—Dated December 14, 1853. Sealed February 20, 1854.

2227. JEAN ALEXANDRE LABAT, junior, of Bordeaux, for An improved system of stoppering vessels and bottles.—Dated September 20, 1853. Sealed February 20, 1854.

2751. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, for Improvements in rotary-engines.—Dated November 25, 1853. Sealed February 20, 1854.—(A communication.)

2752. CHARLES CALIXTE ANDRE GRENIER, Merchant, of Paris, for Improvements in the preparation of paints for buildings and other uses.—Dated November 25, 1853. Sealed February 20, 1854.

2794. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, for Improvements in machinery for manufacturing horse-shoes.—Dated December 1, 1853. Sealed February 20, 1854.—(A communication.)

2841. LEWIS HARVEY BATES, of Bradford, York, Engineer, for Improvements in machinery for stamping and cutting metal nuts, and other similar metal articles.—Dated December 7, 1853. Sealed February 20, 1854.

1954. VICTOR EMILE WARMONT, of Neuilly, Seine, France, for Improvements in dyeing and ornamenting skins, fabrics, and other substances.—Dated August 22, 1853. Sealed February 22, 1854.

1964. WILLIAM MANN, of Stepney, in the county of Middlesex, Gas Engineer, for Improvements in the purification of gas and in the treatment of the material used in such purification.—Dated August 23, 1853. Sealed February 22, 1854.

1978. JOHN SHAW, of Manchester, Landscape Gardener, and JOSEPH STEINTHAL, of the same place, Clerk, for An improved manufacture of artificial manure.—Dated August 25, 1853. Sealed February 22, 1854.

2542. BENJAMIN BUTTERWORTH, of Calder Cottage, Caldershaw, near Rochdale, Lancaster, Grocer, for Improvements in combining oil with other liquids for the obtainment of a new lubricating compound. —Dated November 2, 1853. Sealed February 22, 1854.—(Partly a communication.)

2003. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for Certain improvements in the production of electricity.—Dated August 29, 1853. Sealed February 22, 1854.—(A communication.)

2125. JOHN WAKEFIELD, of Inchicore Works, Dublin, Engineer, and JAMES BASKERVILLE, of same place, Engineer, for Improvements in and applicable to valves for reciprocating engines driven by steam or other elastic fluid.—Dated September 14, 1853. Sealed February 22, 1854.

2921. WILLIAM TRANTER, of Birmingham, Gun Maker, for Certain improvements in fire arms, and in bullets, and in waddings to be used therewith.—Dated December 16, 1853. Sealed February 22, 1854.

2153. WILLIAM SHELBOURNE ICELY, of Bromley, in the county of Middlesex, for Improvements in mechanical telegraphs.—Dated September 16, 1853. Sealed February 22, 1854.

2387. AUGUSTUS APPLEGATH, of Dartford, in the county of Kent, for Improvements in printing and embossing paper with a view to prevent forgery.—Dated October 15, 1853. Sealed February 22, 1854.

THE

REPERTORY

OF

PATENT INVENTIONS.

No. 4. Vol. XXIII. ENLARGED SERIES.—APRIL, 1854.

Specification of the Patent granted to George Edmund Donisthorpe *and* John Crofts, *of Leeds, in the County of York, for Improvements in Combing Wool, Hair, or other Fibrous Materials.*—Dated Jan. 28, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—These improvements have for their object modifications of that class of machinery for combing wool and other fibrous materials for which patents have been obtained by George Edmund Donisthorpe and others, and are generally known to the trade as Lister and Donisthorpe's wool-combing machines; and these improvements consist,

First, In arranging a porter-comb, with the teeth downwards, in place of upwards, so that in working the teeth descend into and take the wool or fabric from the nipping apparatus, and carry it over the travelling-combs, and deliver the wool or fibre on to the travelling-combs by a brush or otherwise. The teeth of the porter-comb move freely through the brush or discharging apparatus; and,

Secondly, The improvements consist in so arranging

apparatus as to dispense with the porter or carrying-comb, which has heretofore taken the wool or fibre from nipping apparatus, or from a comb, as the case may be, and has placed the wool or fibre upon a circular or travelling-comb. In the present arrangement no porter or carrying-comb is required, the detached piece of wool or other fibre being taken from gill, or other combs, or feeding apparatus, by a rotary-comb or nipper apparatus, when it comes opposite to travelling-combs, the teeth of which are placed in a horizontal, or nearly horizontal, position. The wool or fibre is delivered from the rotary-comb or nipper, and placed on the teeth of the travelling-combs by means of a brush, or pressing instrument, moved outwards at the time the wool has arrived opposite the travelling-combs. By which combination or arrangement the ends of the wool or fibre will hang vertically, or nearly so, from the teeth of the travelling-combs, which position will offer less difficulty in conducting the wool or fibre to, and its being drawn off by, drawing-off apparatus. In some cases we apply a brush, or other suitable apparatus, in front of the gill-combs, or feeder, which acts to assist in the detaching the wool or fibre by the rotary-comb or nipper apparatus.

The travelling-combs are caused to travel, and are guided over a table by means of racks and pinions, and when the wool has been drawn off from them, and the noil has been removed, they are taken by an endless band and conveyed back, so as to re-enter their guides, to be again filled with wool or fibre.

And, in order that our invention may be most fully understood, we will proceed to describe the means pursued by us in carrying out our present improvements.

Description of the Drawing.

Fig. 1, shows a vertical section of so much of a machine for combing wool or other fibrous material as will enable us to describe the first part of our improvements, which relate to the porter or carrying-comb; and as the other parts of this machine are similar to that described in the specification of a patent granted to Samuel Cunliffe Lister, Feb. 24, 1851, it will not be necessary to repeat the same, except so far as to render the nature and mode of working of our present improvements intelligible. *a*, *a*, are the gill-combs by which the wool or other fibrous material is supplied to the nipping apparatus, *b*, which receives motion from the

shaft or axis, *c*, by a cam, *d*, as is well understood. *e*, is the porter or carrying-comb, which is guided in a frame, e^4, suspended on axes, e^1, e^1, carried by the fixed supports, e^2, e^2, on each side of the machine. The arrangement and construction of the porter-comb and apparatus for delivering the wool on to the travelling-comb, *f*, will be better understood on examining—

Fig. 2, which shows a front view of the porter or carrying-comb, and parts connected therewith. The comb, *e*, is supported by the rods, e^3, e^3, which slide in guides carried by the frame, e^4, e^4, and the comb, *e*, is constantly pressed upwards by the spiral springs, e^*, e^*, acting between the collars on the rods, e^3, e^3, and the lower part of the frame, e^4, as shown. The rods, e^3, e^3, are connected by the cross bar, e^5, which is connected by a pin joint to the link, e^6, supported by a pin joint from the lever, e^7, and an up-and-down movement is given to the comb, *e*, to cause it to descend into, and take the wool or fibre from, the nipping apparatus in the following manner:—*g*, is a lever, carried by a stud, g^1, on the side framing of the machine, and g^2, is a truck or roller constantly borne up by a spring against the surface of one of the cams on the axis, *c*, which actuates the nipping apparatus, and the lever, *g*, gives an up-and-down movement to the lever, e^7, and carrying-comb, *e*, by means of the connecting-rod, g^4, at each revolution of the axis, *c*.

We will now describe the brush, or discharging apparatus, for delivering the wool or fibre from the carrying-comb, *e*, on to the circular, or it may be other, travelling-combs, *f*. The brush, *i*, is supported by rods, i^1, i^1, which slide through guides, i^2, i^2, on the swinging frame, e^4, e^4. The rods, i^1, i^1, are connected by the cross bar, i^3, which is connected by a link, i^4, with the lever, i^5, carried by the upright support, i^6, affixed to the framing of the machine. The lever, i^5, and brush, *i*, are raised and lowered by the lever, *j*, carried by a stud on the side framing of the machine. The lever, *j*, is depressed by a friction-roller, j^1, carried by a stud on the side of one of the cams, *d*, at each revolution of the axis, *c*, and by means of a connecting-rod, j^2, gives motion to the lever, i^5, which causes the brush, *i*, to descend and discharge the wool or fibre from the carrying-comb, *e*, on to the travelling-comb, *f*, at the time it is over the teeth of the comb, *f*. The frame, e^4, is caused to swing to and fro on its axes, e^1, e^1, in the following manner, in

order to be in a position to take the wool or fibre from the nipping or feeding apparatus, and carry it into a position over the travelling-combs, *f*, to be delivered thereto by the brush or discharging apparatus just described:—*k*, is a lever moving, *m*, a stud, supported by a bracket on the framing of the machine. The lower end of the lever, *k*, is attached by a pin joint to the connecting-rod, k^1, which receives motion from an eccentric, k^2, on the axis, *c*, the upper end of the lever, *k*, being connected by a rod, k^3, to an arm, k^4, on the frame, e^4; all which will be readily understood on examining the drawings. *l*, is a curved plate, fixed at the back of the travelling-combs, against which the teeth of the porter or carrying-comb are brought in contact, in order to cause them to assume the curve of the travelling-comb, *f*, at the time the wool or fibre is being delivered thereto, the brush, *i*, being formed to suit the curve of the travelling-combs.

We will now describe the arrangement of apparatus for combing wool, hair, or other fibrous material, wherein we dispense with the porter or carrying-comb, which has heretofore taken the wool or fibre from the nipping apparatus, or from a comb, as the case may be, and has placed the wool or fibre on to circular or travelling-combs, to be afterwards drawn off by drawing-off apparatus, as is well understood.

Fig. 3, shows a vertical section of so much of a machine for combing wool or other fibrous material, as will enable us to describe this part of our improvements.

Fig. 4, shows a transverse section of the rotary comb or nipper.

Fig. 5, a longitudinal section of the same.

Fig. 6, shows the inner side of one of the end plates, the rim of which controls the action of the rotary-comb; and

Figs. 7 and 8, show a front view and longitudinal section of the horizontal travelling-comb. The feeding apparatus, the gill-combs, and the drawing-off apparatus, employed in connexion with this machine, being similar to what has been before described in patents granted to the said George Edmund Donisthorpe and others, it will not be necessary to repeat the same, as a workman acquainted with this class of machinery will readily understand how to apply the same in combination with our present improvements; and we have only thought it necessary to give a particular description of the construction of the rotary-comb or nipper apparatus, which takes detached pieces of wool or fibre from gill

or other combs or feeding apparatus, which are delivered directly therefrom, without the aid of a porter-comb, on to the teeth of horizontal travelling-combs, the nature of which we shall also particularly describe. *a*, is the axis of the rotary-comb or nipper apparatus, which turns in bearings on the side framing of the machine, and receives motion by a band or strap from a steam-engine or other motive power. *b*, is a drum or cylinder carried by the axis, *a*, and there are grooves formed in the ends of the cylinder, *b*, which guide the bars, *c*, *d*, that carry the rotary-comb and delivering brush or instrument, when in the act of taking the wool or fibre from the gill or other feeding apparatus, and in delivering it on to the travelling-combs. *c*, *c*, are the bars which carry the rotary combs or nippers; and c^1, c^1, are friction rollers on the ends of the bars, *c*, which in the rotation of the cylinder, *b*, travel over the cam surfaces formed within the rims of the end plates, *e*, *e*, affixed to the side framing of the machine; the bars, *c*, *c*, with their combs, are constantly pressed outwards by the spiral springs, c^2, c^2, which, by pressing against the bars, *d*, *d*, act to force the bars, *d*, *d*, inwards, together with the brush or delivering instruments, which are attached to the bars, *d*, *d*, by the plates, d^1, d^1; when the friction rollers, c^1, c^1, and combs, *e**, in their revolution, arrive at the step, *e**, of the cam surface, the teeth of the combs, *c**, will be forced out from the surface of the cylinder and pass into the portion of wool or fibre, which is presented to it by the feeding apparatus; and in its further revolution a piece of wool or fibre will be detached and carried forward to a point opposite to the teeth of the horizontal travelling-comb, *f*, at which point the cam surface will act to withdraw the teeth of the comb, *c**, within the surface of the cylinder, *b*, and at the same time the ends of the bar, *d*, will be acted upon to force out the brush or delivering instruments, *d**, so as to place the detached piece of wool or fibre upon the teeth of the travelling-comb, *f*. In order to assist the rotary-comb in detaching the wool or fibre from the gill or feeding apparatus, in cases where the nature of the fibrous material renders it desirable, a brush or other yielding surface may be caused to come into action at and meet the point of the rotary-comb, just at the time it enters the wool or fibre, and then move away with it whilst the detaching of the fibre takes place. The ends of the bars, *d*, *d*, are acted upon to force out the brush, *d**, in the following manner:—*g*, is a cam on the axis, *g**, which gives motion to the screw gill or feed appa-

ratus; the cam, *g*, in its revolution, depresses the end of the lever, *h*, which is constantly borne against the surface of the cam by a spring, h^1, as shown; the lever, *h*, is carried by the axis, *i*, on which there are arms, *j*, to which bars, *k*, are attached by pin joints; the other ends of the bars, *k*, being bent at right angles, pass through slots or openings, *k**, formed in the end plates, *e*, *e*; and when the ends of the bars, *d*, *d*, in their revolution, come opposite to the ends of the bars, *k*, the bars, *k*, will come into action and force the ends of the bars, *d*, outwards, and the wool or fibre will be delivered from the comb, *c**, on to the teeth of the travelling-comb, the nature and action of which we will now proceed to describe:—In front of the drum or cylinder, *b*, which carries the rotary-comb, there is a fixed table, *l*, over the lower surface of which the combs, *f*, are caused to travel by means of pinions, *m*, *m*, which pass through slots formed in the table, *l*, and take into racks formed on the underside of the plates, f^1, which carry the combs, *f*; motion is communicated to the pinions, *m*, *m*, from the main shaft or axis, in any convenient manner; the combs, *f*, will successively force each other along the surface of the table; and when the wool or fibre has been drawn off by suitable drawing-off apparatus, and the noil has been removed, the plates, f^1, and combs will be successively tilted by the spring, *n*, into the position shown in the drawing, and a sharp point or points on the upper surface of the plate, f^1, will enter into the surface of the endless band, *p*, by which the combs, *f*, will be successively drawn over the upper surface, l^1, of the table, *l*, and will then fall on to the lower surface and be caused to re-enter between the guide-surfaces, *l*, l^1, of the table, by the weighted lever, *o*, which by its own gravity presses each successive plate, f^1, and comb, so that its rack may be taken out by the teeth of the pinions, *m*, and be again filled with wool or fibre by the rotary-comb or nipping apparatus, all which will be readily understood on examining the drawings.

Having thus described the nature of our said invention, and the manner of performing the same, we would have it understood that we make no claim to the parts separately, nor do we confine ourselves to the details herein described.

But what we claim is,

First, the combination herein described for causing the porter-comb to work with its teeth downwards, and to descend into and take the wool or fibre from the nipping apparatus, and carry it over the travelling-combs and deliver

the wool or fibre on to the travelling-combs by a brush or otherwise; and

Secondly, we claim the combination of apparatus herein described for dispensing with the porter or carrying-comb, and causing the wool or fibre to be delivered from the rotary-comb or nipper and to be placed in the teeth of travelling-combs.—In witness, &c.

GEORGE EDMUND DONISTHORPE.
JOHN CROFTS.

Specification of the Patent granted to SAMUEL CUNLIFFE LISTER, *of Manningham, in the County of York, for Improvements in Machinery for Washing Wool and Hair.* —Dated August 1, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improvements in washing machinery consist in covering washing rollers with gutta percha or unvulcanized caoutchouc or similar material, either in combination with other substances or otherwise.

Also in causing wool or hair to pass through a washing bowl by means of a trough or spout placed inside of a long washing bowl. The wool or hair is fed to the spout by an ordinary feed cloth, and then is carried forward by revolving vanes, which cause the water and wool or hair to be constantly moving along the trough or spout, and at the opposite end to that into which it is fed is placed an endless apron or cloth, which receives and carries the wool or hair forward to the expressing rollers, and by this means the wool or hair is constantly fed in at one end and delivered at the other through the expressing rollers.

Having thus stated the nature of my invention, I will proceed to describe the manner of performing the same.

The plan which I find to answer best for covering washing rollers with unvulcanized caoutchouc or gutta percha or similar material, either in combination with other substances or otherwise, is to make it into rings or washers, and then to put them upon an iron roller of suitable diameter and press them together between iron flanches, so as to make them as solid as possible, or the roller may be covered in one piece; but I do not confine myself thereto, as variations may be made in carrying out the above-described parts of my invention.

I will now describe the plan which I adopt for imm
ing the wool and conducting it through the suds to
expressing rollers, which will be readily understood by
ference to the drawings. a^1 and a^2, are a pair of feed clo
the wool is laid upon a^1, and compressed and carried
ward, a^2, the upper and lower feeding apron travellin
the same speed, say about two surface feet per minute,
is delivered by the rollers, B^1, B^2, to a revolving fan g
at about twice the speed of the feed rollers; this fan w
in a trough or spout, E, placed within the washing bow
and is full of holes at the bottom so as to allow the w
free entrance, care being taken not to make the holes
large, in that case the wool would go through into
water beneath. D, is another fan which carries the
forward on to the feed apron, F, which then delivers i
the expressing rollers, G, G.

I do not claim any of the parts separately, nor do I
fine myself to the details,

But what I claim is, the combination of apparatus
washing wool and hair.—In witness, &c.

SAMUEL CUNLIFFE LIST

Specification of the Patent granted to HENRY Mc
NAYLOR, *late of No.* 111, *Montpelier-row, Bloomsl
but now of No.* 30, *Newhall-street, Birmingham, in
County of Warwick, for Improvements in Affixing Po
and other Stamps.*—Dated August 11, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., 8
This invention consists of a combination of apparatu
affixing postage or other stamps to letters and docum
Such apparatus consists of a chamber to receive a pi
postage or other stamps with the adhesive surfaces upw
and the upper one is at all times in a position to be t
on to a letter or document when the same has been m
ened by another part of the apparatus, which consists
roller with sponge or porous surface, and water is
plied thereto by another roller revolving in water, or b
an endless cloth or fibres moved thereby through wate
the moistened sponge or fibre is lifted up by a lev
instrument. The apparatus is inclosed in a case. Ha
thus stated the nature of my said invention, I will pro
to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a plan.

Fig. 2, a side elevation.

Fig. 3, a vertical section showing the parts of the apparatus in the act of applying a stamp.

Fig. 4, shows another vertical section of the apparatus in position ready to receive a letter or document in order that a stamp may be applied.

Fig. 5, shows a vertical section taken through the water trough; and

Fig. 6, shows another side view, by which it will be seen that the apparatus may be kept locked. In each of these figures the same letters indicate similar parts. *a*, *a*, is the box or case of the apparatus; *b*, is the trough containing water in which is placed a roller, *c*, coated with sponge or other suitable matter in order to bring moisture up from the trough; *d*, is a metal roller fitting loosely on its axis, as is shown; *e*, is a cover, which is capable of being moved on its axis, *f*, and thus leave the water trough and the chamber in which the adhesive stamps are contained uncovered. The cover carries the axis, f^1, of the roller, *d*, and the under surface of the cover acts as a guide in introducing the corner of an envelope, or note, or letter, or other document to be moistened, and to receive an adhesive stamp, the cover not fitting down on the table or upper surface of the box, *a*, and the cover also carries a stop, *g*, against which the corner of the document comes when it has been introduced to receive a stamp, and such stop moves on an axis, g^1, and retains its position by gravity; *h*, is a moveable chamber to contain the adhesive stamps to be used, and they are placed in such chamber with their faces downward and their back or adhesive surfaces upwards; on the under side of the cover, *e*, there is a projection, e^1, of vulcanized india-rubber or other suitable material, which covers over the chamber, *h*, and offers a flexible and elastic surface for the envelope, letter, or other document about to receive a stamp to be pressed against it. The moveable chamber, *h*, is made on the interior of the form of the stamps to be applied, and it is capable of sliding up and down in the case, *a*, of the apparatus, and by reason of the spring, *i*, it has constantly a tendency to rise up, so as to come above the table or upper surface of the case, *a*. The stamps are placed on the piston, *j*, which has below it a

plate, j^1, acting as the piston rod which slides within the chamber, *h*, and the piston is constantly drawn down by the vulcanized india-rubber spring, *k*. The piston is moved upwards by means of the lever key, *l*, which is connected to the lever, *m*, by the link or rod, m^1, and the lever, *m*, is connected to the slide of the piston by the link, *n*, hence when the key is depressed the piston with the stamps thereon rise, and when released the piston descends, carrying with it the chamber, *h*, by reason of the greater strength of the india-rubber spring, than that which raises the chamber, *h*. In using this apparatus, the corner of the document or envelope is passed under the cover, so as to pass between the moistened roller and the pressing roller, by which the surface of the paper will be moistened; the document or envelope is then to be moved so as to bring the moistened surface over the chamber, *h*, when by pressing the key, *l*, the chamber will be raised by its spring so as to bring it up to the surface of the moistened paper, and the further movement of the key will raise the piston and force up the stamps, so that the uppermost one will come in contact with the moistened surface, and the stamps will be pressed forcibly against the moistened surface. The key then being released will allow the india-rubber spring to draw back the piston and the chamber, *h*, and the apparatus will be again in position to receive another envelope, note, letter, or document.

I would state that for some uses the damping part of the apparatus may be used separately. In which case I prefer to form the damping apparatus as shown at figs. 7, 8, and 9, which respectively show a plan, a front elevation, and a transverse section. In this arrangement there would only be that part of the previous combined apparatus which consists of the water trough, the roller dipping therein, and the pressing roller, as will readily be understood by reference to these figures. This form of part of my apparatus renders it suitable for moistening surfaces on to which adhesive stamps are to be applied by hand.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I do not claim the separate mechanical parts of which the apparatus is composed, nor do I confine myself to the precise details.

But what I claim is, the combination of the mechanical parts as herein described.—In witness, &c.

HENRY MOORE NAYLOR.

Specification of the Patent granted to ROBERT CLOUGH, *of Liverpool, for Improvements in the Construction of Ships and other Vessels.*—Dated August 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention consists of constructing ships or vessels with two bilges instead of the usual form as hereafter described, by which depth and stiffness are given to a ship or vessel, especially those made of iron, which bilges can be modified as circumstances occur.

Description of the Drawings.

Fig. 1, shows a section of a ship or vessel of an ordinary construction having only one bilge, and,

Fig. 2, shows a section of a ship or vessel constructed according to my invention. I would remark that the form and positions of the bilges shown in the drawing, fig. 2, may be varied without departing from my invention so long as two bilges are used.

By thus constructing ships and vessels, each with two bilges, greater stability will be obtained and greater capacity for carrying cargo.

The speed also of such vessels will be greater than when vessels are built with only one bilge, and other advantages will be found to be possessed by ships or vessels having two bilges according to my improvements. And it is the construction of ships and vessels with two bilges which constitutes the peculiarity of my invention.—In witness, &c.

ROBERT CLOUGH.

Specification of the Patent granted to MOSES POOLE, *of Avenue-road, Regent's-park, in the County of Middlesex, for Improvements in Crushing and Pulverizing Quartz and other Substances.*—Dated August 23, 1853.—(A communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The nature of my invention consists in the forming of a

corrugated surface in the bottom of a circular troug
corrugated or toothed rollers working upon the corr
surface in the trough, thereby making the two corr
surfaces come in contact with each other and thus p
a better crushing action than has heretofore been obt

Description of the Drawing.

The same letters refer to the same parts of draw
plan and sectional elevation.

A, is a circular conical cast-iron trough for the pur
containing the material to be operated upon. O
trough are cast projections and a cross or arms to s
the upright shaft and a frame hereinafter described.

B, is a corrugated or toothed bottom, cast of ver
iron to prevent rapid wear, which may be made in seg
or one piece as may be thought proper.

C, C, are five corrugated bevelled rollers, the rims an
rugations of which are cast of very hard iron to p
rapid wear, and put together as shown in the dra
these corrugations corresponding with the corrugate
face, B, and are made to revolve upon the corruga
toothed bottom which is placed in the circular trough

D, the driving bevel-wheel fixed to the upright sh
the purpose of communicating motion to the corrug
toothed roller, C, C.

E, is an upright shaft placed in the centre of the ci
trough, A, supported by the frame at the top and a s
the bottom.

F, F, are five axles attached loosely to the be
rollers, C, C, each terminating in a pin joint fixed
hub or boss of the driving wheel, D, the object of
joint is to allow the rollers to rise or fall in prop
to the resistance that may be presented by the sub
to be operated upon; the outer ends of these axles
project beyond the outer surface of the rollers, whic
jection moves between lugs formed on the inner part
driving wheel, D, these lugs being made of sufficient
to allow the rollers to rise or fall as may be required.

G, is a cast-iron cap secured to the top of the h
boss on the driving bevel-wheel, D, for the purp
holding the pin joints of the axles, F, F, in their
places; by removing this cap one or more of the rolle
axles may be removed, repaired, and replaced with fa

H, is a strong cast-iron frame for the purpose of su

ing the upright shaft, E, and the horizontal shaft, J, which frame is secured to the projections cast on the bottom of the circular trough, A.

I, is a driving bevel-pinion working into the bevel-wheel, D, which pinion communicates motion to the whole machine.

J, is a horizontal shaft upon which is secured the bevel-pinion, I, and the driving pulley or wheel, as may be found most practicable under the circumstances in which the machine may be placed.

Having thus described the nature of the said invention and the manner of performing the same, I would have it understood that what I claim as my invention, and for which I desire letters patent granted, is the construction of a machine with corrugated or toothed surfaces working into each other whereby I obtain a vertical crushing motion and also an amount of pulverizing surface not obtained by any other machine heretofore named.

I do not claim the circular motion, but the peculiar form of surface or any other substantially the same in its effect. —In witness, &c.

MOSES POOLE.

Specification of the Patent granted to GEORGE CULVERHOUSE, *of* 72, *English-street, Hull, for Improvements in Manufacturing Compost or Manure.*—Dated August 24, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object the employment of a boiler and apparatus for boiling bones and matters under pressure in the manufacture of compost or manure. The upper part of the boiler is separate, so as to be lifted up off the lower part. The upper part is, by preference, hemispherical, and is capable of being readily and securely fixed to the lower part, and there is a valve to the upper part, to regulate the pressure at which the boiling shall take place. In order to facilitate the discharging of the contents of the boiler, there is placed into the boiler a cradle or apparatus of the form of the lower part of the boiler, which I prefer to be framed

and covered with wire-work, or with perforated meta
there is a tap to draw off the fluid part of the charge
boiler.

Having thus stated the nature of my said inven
will proceed to describe the means of performing the

Description of the Drawing.

Fig. 1, shows the section of the apparatus used by
carrying out my invention.

Fig. 2, shows a section of the cradle into which the
or animal matters to be boiled are put, and by a s
crane or tackle lifted into the boiler.

Fig. 3, shows an underside view of the cradl
bottom of which is perforated. *a*, *a*, is the boiler, b
ference of cast-iron, which has a cock, *b*, some heigh
the bottom, to draw off the fluid matters; at the sam
there will be at all times sufficient fluid left in the bo
prevent the burning of the boiler. *c*, is the fire-place
the cover to the boiler, which is screwed and clamped
by the screw-clamps, d^1. At the upper part of the c
a weighted valve, the stem of which passes thro
stuffing-box, as shown; by this arrangement, the
may be boiled under pressure. *e*, is a pipe, into whi
ammonia which may come over will flow, and by w
may be conducted into a suitable vessel containing
sulphuric acid. *f*, is a cradle, or vessel perforated
sides and bottom. Into this cradle or vessel the bon
animal matters to be boiled are to be put, the cradle
to be lifted into its place in the boiler, and the cover
boiler is to be fixed as above explained, the boiler
first supplied with a solution of alkali or very dilut
to about two-thirds of its contents. The quantity o
I generally employ is at the rate of about sixty
potash or soda for each 400 cwt. of bones or animal m
or of both combined, and as much water as will, as
stated, fill about two-thirds the contents of the boil
these matters are to be boiled for about four hou
temperature of 300 to 400 degrees of Fahrenheit.
cradle is then to be removed from the boiler, and t
tents removed, dried, and ground. The gelatine an
line compound is also to be drawn off, and spre
evenly and dried, and then ground, and these produ
to be used in mixing composts or manures suitab
wheat and such like crops. Or, in place of soluti

alkali, very dilute sulphuric acid is to be used, in which case much, and in some cases all, of the bones and matters will be reduced, and flow off through the cock, and, when dry and ground, will be more suited for making manure for turnips.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is, the mode herein described of manufacturing compost or manure.—In witness, &c.

GEORGE CULVERHOUSE.

Specification of a Patent granted to CHARLES CUMMINS, *of No.* 148, *Leadenhall-street, for Improving Clock Escapements.*—Dated July 28, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention consists of peculiar clock escapements, one of which consists of a wheel with a plain rim; upon the plane of this rim there are two circles formed of pins, each circle containing an equal number, the pins being equivalent to the quantity of teeth required in ordinary clock escapements. In constructing such an escapement, the distance from the centre of the wheel being determined upon for the interior circle of pins, divide such circle into the requisite number of holes, then describe half-circles, as shown at fig. 5, from the pin-holes in the inner circle, that will bisect each other, and where these half-circles bisect each other will be the distance for the exterior circle of pins. The exterior pins should be twice the size of those in the interior circle; the size of the pins must be allowed for in making up the escapement. On an arm attached to the axis of the crutch is formed a slot-hole, into which is fitted the piece that carries the roller; the slot is for the purpose of altering the position of the roller to be adjusted, and obtain an equal amount of escapement action for the right and left swing of the pendulum.

The distance of the crutch pivot-holes from the escapement-wheel pivot-holes is from five-eighths to an entire diameter of the escapement-wheel; the latter distance should not be exceeded.

The diameter of the roller is equal to the space betw the pins of the interior circle. The space between circles formed by the pins on the escapement-wheel, b less than the diameter of the rollers, will give to the ro by the rotatory motion of the wheel, a revolving alter motion, also an oscillating motion: the latter sustains vibration of the pendulum.

The other escapement, and which I call the double-r escapement, has a wheel with one circle of pins, or s projections. The arm, bearing the pieces into which pivots of the rollers work, is attached, as in the single-r escapement, to the axis of the crutch; the distance f the escapement-wheel pivots to the crutch-pivots is like the same. The diameter of the rollers is guided by space between the pins, free passage being required them, and no more; the rollers should be alike in respe shape and size. The upper roller is acted upon from interior of the wheel, the lower roller from the exte The distance between the rollers should be within fourth part of the circumference of the wheel, as the e tive angle of the escapement is diminished by exce that limit. The exact position or adjustment is obtaine the aid of the slot-holes in the arm. Suppose the u roller for the time being to be acted on by the rota motion of the escapement-wheel, this action upon the u roller ceases by the pin leaving it; the lower roller wil moved in towards the centre of the wheel, and into space between two of the pins; the wheel will the arrested by a pin coming in contact with the lower ro this roller will then begin to revolve; the pendulum, ha completed an ascending arc, during its return will re from the lower roller an impulse; the upper roller wil moved out into the space between two of the pins, a pin will again arrest the wheel; the pendulum perform the opposite ascending arc, then, upon its retu will receive from the upper roller an impulse, and complete the action of the escapement.

Brass pins or projections and steel roller or roller steel pins or projections and brass roller or rollers, applicable, and preferred for these escapements. Fri being considerably reduced in these escapements, oil i required, where it is indispensable in ordinary clock es ments.

Description of the Drawing.

Figs. 1 and 2, represent the single-roller escapement under action for the right and left swing of the pendulum. A, the escapement-wheel; B, the arm; C, the adjusting piece, which carries the roller, D.

Figs. 3 and 4, represent the double-roller escapement in like positions. A, the escapement-wheel; B, the arm; C, C, the adjusting pieces, which carry the rollers; D, D, the rollers.

Fig. 5, shows the method or plan for finding the distance of the exterior circle, for the single-roller escapement, from the centre of the wheel.

Fig. 6, side view of the arm, B, for the single escapement.

Fig. 7, shows a side view of the arm, B, for the double-roller escapement.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I do not confine myself to the precise details shown and described. But I claim the combinations of escapements herein described, whereby an entire roller acts with an escapement-wheel, or entire rollers act with a suitable escapement-wheel.—In witness, &c.

CHARLES CUMMINS.

Specification of the Patent granted to LEMUEL WELLMAN WRIGHT, *of Chalford, in the County of Gloucester, Engineer, for Improvements in Machinery or Apparatuses for Reducing and Pulverizing Gold and other Metalliferous Quartz and Earths, and in Separating Metals therefrom.*—Dated July 2, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention has relation to the reducing and pulverizing of gold and other metalliferous quartz, and to the separation of the metal therefrom. I make use of three different apparatuses: the first, for reducing the heavy quartz or dense and hard earths; the second, for pulverizing the same; and the third (which comprises mixing and washing arrangements), for separating the gold or other metal from the pulverized quartz or earths containing the same.

My first apparatus consists of a central iron cylin roller mounted upon a shaft revolving in bearings framework of the machine; outside this cylinde mounted upon a separate axis, are two rings in are bearings for the reception of the axes of five o smaller iron rollers, caused to revolve by frictional with the central cylinder. These smaller rollers extend entirely round the circumference of the cy but only to about one-half thereof. The inner cyli caused to revolve, the quartz or earth is directed i apparatus between the upper roller and cylinder, the revolution of this cylinder it is carried succ between it and the remaining rollers, and finally lea apparatus, being caused to pass between and issue fr two last rollers in the series.

My second machine or apparatus, into which the p reduced quartz or earth may be transferred to be pul consists of a pair of heavy rollers free to revolve shaft mounted in bearings in the frame. Upon these is a rotary disc or platform on which the material pulverized is placed; it is provided with scra gatherers, and is caused to revolve; the gatherer tinually present the stuff under the heavy rollers, w caused to revolve upon their axis by contact with th disc. I generally find it advisable to moisten the st add sufficient moisture to bring it into the state of p

My third or washing machine consists of a whe dashers caused to revolve in a trough or vessel i metalliferous quartz in a pulverized state, or earth, is in order to break it up and mix it well with water the trough; the water and metalliferous stuff th through a channel into a deep vessel, inside whic agitator, consisting of a cross head with two or mo depending therefrom, suspended from a shaft through the top of the vessel, and to which rotary is communicated. The centrifugal action produced rotation of the agitator will cause the lighter materia thrown to the outer circumference of the revolving while the heavier materials will flow nearer the cen gradually fall in the direction of the axis of the v column, and will be finally deposited on the bottom vessel.

Fig. 1, of the Drawings hereunto annexed, repr side elevation of a machine for crushing or breakin

quartz rock or earths, compounds, or metalliferous ores containing gold or other metal, previous to being reduced to a state of powder by other arrangements of machinery, as hereinafter explained. A, A, is a central cylinder of iron firmly fixed upon the shaft, B. This cylinder forms the prime moving power, being driven by means of a steam-engine or by water. C, C, are a number of smaller cylinders arranged partly round the cylinder, A, and driven by frictional contact therewith. D, D, are cheeks or framework for supporting and combining the several parts of the machine, being connected and held together by transverse iron tie rods, *a*, *a*. The spindles of the cylinders, C, C, are supported, and turn in blocks, E, E, capable of being adjusted by screws, F, F, in order to regulate the distance or space between the main cylinder, A, and the smaller cylinders, C, C, as circumstances may require. Or the cylinders, C, C, may be adjusted and held up against the main cylinder, A, by means of weighted levers, or any other convenient contrivance. The adjusting blocks, E, E, rest on and are supported by iron bearers, G, G, which are connected to or form part of the framework, D, D. H, is a fly-wheel on the main shaft, B, for regulating the motion of the machine. I, is a hopper from which the machine is fed or supplied with the ore or other substance to be crushed. The action of the machine will be readily understood from the foregoing description of its construction. When it is at work the material as it is crushed follows the course indicated by the arrows, and is delivered from the machine at the point, *b*.

Fig. 2, represents a side elevation, partly in section, of a machine to be employed for reducing the ore or other substance to an impalpable powder, after having been subjected to the action of the crushing machine just described. A, is a circular disc of cast-iron (shown in section) flanged at the edge, and firmly fixed to the upright shaft, B, which is also of cast-iron. The lower end of this shaft turns in a cast-iron step, C, fixed to the base of the framing, and the upper end works in bearings, D, in the upper part of the framing. E, E, are two cast-iron cylinders or rollers running on edge, and resting on the disc, A, and revolving by contact with it. F, F, is bevelled gearing, by which motion is communicated from any suitable prime mover to the shaft, B, and disc, A, and from this latter to the cylinders or rollers, E, E, as before mentioned. G, G, is the shaft or

axle on which the rollers, E, E, revolve, and H, H, the bearings for the shaft, G, G, which are fixed to the framing of the machine. The rollers, E, E, instead of being formed with flat surfaces working against the disc, A, may be constructed with convex surfaces working into a corresponding concavity in the disc, as shown at *a*, *a*. The ore or substance to be reduced in this machine having been previously crushed in the machine shown in Fig. 1, and before described, is introduced into the machine, with a sufficient quantity of water to cause it to be worked by the action of the rollers, E, E, into a stiff pasty mass, in which state it is removed for subsequent treatment. The machine should be furnished with gatherers or scrapers, so as to cause the material to be kept constantly under the rollers, E, E, as the disc, A, revolves.

Fig. 3, is a side elevation of a machine for the purpose of mixing the pulverized ore as it comes from the machine, fig. 2. A, is a three-sided box or trough, open at top, in which is fitted a float wheel, B, by which the pulverized ore is agitated and mixed previous to its passing into the washing machine. In working with this machine, the wheel, B, is put in motion in the direction of the arrow by any convenient means, and water is admitted into the box, A, by a pipe and cock, in sufficient quantity to bring the mixture to a regular and suitable consistency for subsequent operations, as it passes from the box, A, by the spout, C. The quantity of water required will depend upon that of the pulverized ore placed in the box, A.

Fig. 4, is a vertical section of a washing machine for operating on the mixture of ore and water coming from the mixing machine just before described. A, is a cylindrical vessel or casing composed of wood or metal, and having a spherical bottom. B, is an agitator or stirrer composed of a crosshead with two or more vertical arms, which works inside the cylinder, A, and reaches nearly to the bottom of it. C, C, are bevel wheels, by which the agitator, B, is set in motion, and means should be provided for enabling the velocity of the motion to be increased or diminished as may be required. In working with this machine, the cylinder, A, is filled with water nearly to the level of the trough leading from the mixing machine, and the agitator, B, is then set in rapid motion by means of the gearing, C, C, when the water will take a circular course, somewhat as shown by the dotted lines, *a*, *a*; the mixture of ore and water from

; machine is then admitted to the cylinder, when luid mass will also take the same circular course er, and the lighter particles will be thrown by l force from the centre towards the sides of the hile the heavier particles will arrange themselves, to their specific gravity, nearer to the centre, st particles of gold and other metals being found tre of the cylinder, where they will fall by gravi- ming a conical heap at the bottom, as shown d the lighter particles flowing out through the pipe, :k of which is left open during the operation. washing is completed, the gold and metal col- the centre of the cylinder can be withdrawn ıe pipe, E, by opening the cock attached to it.

ring now described the nature of my said inven- in what manner the same is to be performed, hat what I claim as my invention is,—

he machinery or apparatus for crushing gold l metalliferous ores, represented in fig. 1, of the annexed, and hereinbefore described, in so far the employment therein of the main or central mbined with several small cylinders partly sur- he same, and revolving by contact with the main ad the materials under process of crushing.

the machinery or apparatus for reducing or g gold quartz and metalliferous ores, represented of the Drawings annexed, and hereinbefore in so far as regards the employment therein of ntal rollers or cylinders working against a re- ible or disc, and caused to revolve by contact and the employment of scrapers or gatherers for ıe material to be reduced under the action of the rollers; and,

he mixing machine represented in fig. 3, and the achine represented in fig. 4, of the Drawings and hereinbefore described, each in the peculiar n of parts of which the same consists. — In :c.

LEMUEL W. WRIGHT.

Specification of the Patent granted to EDWARD BRIG
Castleton Mills, near Rochdale, in the County of L
ter, Manufacturer, for Improvements in the Manu
of Pile Fabrics, and in the Machinery or App
Employed therein.—Dated May 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c.,

My invention consists,

First, in manufacturing a fabric with a cotton wa
silk weft having a satin face on both sides. This
may be produced in an ordinary loom; the weft i
floated over the warps to form a satin face on the
side, and then under the warps to form a satin face
under side of the fabric. The mechanism for actuati
heddles, in order to produce the requisite sheds, i
understood by persons conversant with satin weavin
therefore does not require to be particularly describe

When the improved fabric has been thus woven t
is raised by teasles or other suitable mechanism so
produce a plush face; the operation of raising the
produce a plush is partly performed by the improved
nery represented in the annexed drawing, and partly
usual machinery, which is well understood in the trad
forms no part of my invention.

Description of the Drawing.

a, represents the framing of a loom; *b*, the crank
c, the lay sword; *d*, the breast beam; *e*, a cross rai
f, the taking-up roller. Near the breast beam, *d*,
segment, *g*, which is covered with needle-pointed c
cards or with teasles; and *h*, is a similar segment
near the cross rail, *e*. These segments are made to
on their axes by the levers, g^1 and h^1, and by the
which is jointed to an eccentric on the tappet shaft,
any other convenient part of the loom. When the loo
work the fabric is carried forward by the taking-up r
and the nap is partly raised on the upper and under s
of the fabric by the cards or teasles on the segments,
h. The loose fibres in the teeth of the cards or tea
cleaned out by hand or by suitable machinery.

I wish here to observe, that I also propose to

rollers in place of the segments, *g* and *h*; these rollers may either revolve or vibrate on their axes. When rollers are employed it is necessary to have a revolving brush to clean the teeth of the roller, and to lay the nap on the fabric. Combs working eccentrically may also be used in place of the segments, *g* and *h*.

My improvements also consist in weaving raised or tissue plush with printed or party-coloured silk weft, so as to produce a pattern or design during the operation of weaving. After the weft has been printed or party-coloured it is woven into the fabric so as to produce a satin face (either on one or both sides), which is afterwards raised into a plush in the usual manner, or in the manner hereinbefore described.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is,

First, the weaving of such a fabric as I have described, having a satin face on both sides, and raising the nap thereon to produce a pile fabric.

Secondly, I claim the improved machinery marked, *g* and *h*, as shown in the drawing, and as described, for raising the nap on silk plush.

And, lastly, I claim the weaving of raised or tissue plush with printed or party-coloured weft.—In witness, &c.

EDWARD BRIGGS.

Specification of the Patent granted to BERNARD PEARD WALKER, *of Wolverhampton, in the County of Stafford, Cut Nail Manufacturer, and* JAMES WARREN, *of Mile End-road, in the County of Middlesex, Gentleman, for Improvements in the Manufacture of Iron.*—Dated May 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our said invention relates:—To an improved system or mode of manufacturing puddled iron, whereby the operation is accomplished with a much greater economy, both of time, labour, and fuel, than has been hitherto obtained, whilst the iron so prepared is of a superior quality to that

manufactured by the ordinary process. Our imp process consists in first melting the iron in a cupola furnace, or refining fire of the ordinary onstruction, which it is conveyed in a fluid state to an improved dling furnace," where it is kept at a high temperature mixed with suitable "fluxes," and subjected to the of carbonic oxide, oxygen, and other gases, in or purify it from those substances, the admixture of constitutes the difference between wrought and cast It is obvious that in place of melting the iron in a rate furnace it may be at once melted in the pu furnace.

Fig. 1, on Sheet 1, of the drawings, represents a tudinal vertical section of our improved "puddlin nace;" and

Fig. 2, is an end elevation of the same. A, is an nary fire-place fitted with grate bars and charging h This furnace communicates with the interior of the dling furnace, C, which is composed of a moveable of any convenient form, a cylindrical one being sho the drawings. This furnace, which is composed o brick or other suitable material, is enclosed in an casing of wrought iron, D, and revolves on its hori axes, being driven and supported by a set of four v-g anti-friction pulleys, E, E, two of which are shown in The cavity or internal portion of this furnace, inst being parallel with the axis of its motion, is formed angle or incline therewith, as clearly seen in the dra by this arrangement, when a rotatory motion is com cated to the puddling furnace by means of the pull bevel gearing, F, and driving pulley, G, the portion interior of the furnace will be constantly changing, t effectually agitating the melted iron without the ne of hand working or turning. In this way the m thoroughly exposed to the action of the heat and passing from the furnace, A, through the interior puddling furnace, C, on its way to the chimney, H. the iron is sufficiently purified it is removed from t nace by means of suitable hooks or bars applied t the discharging aperture, I, when it falls through the ing, J, and is eventually withdrawn by the door, K. then conveyed to the shingling machine to be wor the ordinary manner. The fuel employed in this may be either coal or coke, or the escape gases from

furnace. And the draught may be obtained either by employing a sufficiently high chimney, or the use of any convenient blower. It will be obvious that any form of moveable or rotatory "puddling" furnace may be employed as an ellipse, for example, or the bottom of an ordinary "puddling" furnace may be made to revolve horizontally at a slight angle so as to agitate the melted metal upon its surface, or it may be made to gyrate, if desired, for the same purpose, the main principle of this portion of our invention being the communicating of a rotatory or other movement to that portion of the furnace containing the iron to be operated upon, for the purpose of agitating it and facilitating the "puddling" operation.

Fig. 1, on Sheet 2, of our drawings, represents a longitudinal vertical section; and

Fig. 2, is a horizontal section of another modification of our invention, showing its application to furnaces of the ordinary construction. In this arrangement the furnace, A, is of the ordinary construction, formed with a bridge, B, and fitted with fire-bars and ash-pit. The hearth, C, of cast iron, is made to revolve at a slight angle, being nearly horizontal, and is lined with scoria and sand, as in the bottom of ordinary puddling furnaces. A rotatory motion is communicated to it by the supporting inclined shaft, D, and bevel gearing, E, which may be driven by pulleys, E', or any other suitable mechanical arrangement. The lowest portion of the hearth, C, is immediately behind the bridge, and, as it revolves, the melted metal is continually agitated, whilst it is simultaneously subjected to the action of the flame and gases which eventually pass off by the flue, F, to a suitable chimney. When this operation is completed the melted metal may be discharged through the side discharging door, G.

Having now described and particularly ascertained the nature of our said invention, and the manner in which the same is or may be used or carried into effect, we would observe, in conclusion, that we do not confine or restrict ourselves to the precise details or arrangements which we have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of our invention;

But what we consider to be novel and original, and therefore claim as the invention secured to us by the hereinbefore in part recited letters patent, is,—

First, the improved process or mode hereinbefore d
scribed of manufacturing puddled iron.

Secondly, the mode of manufacturing puddled ir
wherein a moveable containing vessel or furnace is e
ployed for the purpose of agitating and consequently "pu
dling" the liquid metal.—In witness, &c.

BERNARD PEARD WALKER.
JAMES WARREN.

Specification of the Patent granted to RICHARD LONGB
HATTERSLEY, *of Keighley, in the County of Yo
Machine Maker, for Improvements in Machinery
Forging Iron and other Metals.*—Dated June 2, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c
My invention of improvements relates to the forging
shaping of steel, iron, or other malleable metals, by mec
nical means, into certain descriptions of articles, m
particularly the flyers, and other like articles used in
several branches or processes of spinning or doubl
fibrous materials, and applicable more particularly to t
class of forging machines which forms the subject matte
letters patent granted to Mr. William Ryder, and dated
8th day of February, 1841, although I do not confine
adaptation and application of my improvements to that c
of machines exclusively.

My improvements consist in combining the swages
dies or hammers, between which the forging operatio
performed, in such manner as considerably to simplif
and to reduce the length of time necessary to form
article, and thereby to forge and shape it at one heat of
metal in most cases.

The accompanying drawing will illustrate my impr
ments, as adapted and applied to one of the above-na
class of forging machines, and known as "Ryder's machin

Fig. 1, representing a front elevation, and
Fig. 2, a transverse elevation of one of these machine
Fig. 3, shows the face of the ordinary upper, and
Fig. 4, the face of the ordinary lower flat swages;
Fig. 5, the face of the upper combined swage, and

Fig. 6, the face of the lower one; and

Fig. 7, a vertical section of the upper and the lower combined swages, and swage-bars through the line 1,——1.

It will not be necessary for me to more than briefly describe those parts of the machine and their action, which do not form my present improvements. Upon the general framing, A, of the machine is mounted the horizontal eccentric or cam-shaft, B, which is driven in the ordinary manner by the usual fast and loose pulleys, C; the eccentrics, D, D, upon this shaft, during its revolutions, by their action upon the bars, E, E, give a rapid, vertical movement to them, they duly sliding in guides upon the framework of the machine; these bars are the upper swage-bars, their lower ends being socketed to receive the stems of the swages, F, G; the swage-bars are provided with springs, H, H, by which they are raised and supported after each downward action of the eccentrics; the lower swages, F^1, G^1, are in like manner attached to the lower swage-bars, I, I, and these have screwed connexions at their lower ends to adjust their respective heights; the lower swage-bar carrying the ordinary flat swage is supported upon some elastic medium, so as to give a certain amount of elasticity to the lower swage, and reduce the concussions arising from the action of the machine; the lower swage-bar carrying the combined swage rests upon an eccentric or cam, K, upon a shaft which has a lever-handle, L, upon its outer end, and is for the purpose of raising the lower swage when required.

Hitherto, in forging or shaping articles by mechanical means, a separate and distinct pair of swages or dies were used for each process or form of the forging operation, and each of these pairs of swages were mounted on its own separate and distinct swage-bars; thus the drawing down of the metal was effected by one pair of swages, the formation of any boss or projection upon the article by a second pair, the cutting off from the bar or rod of metal by a third pair, and so on for each separate process; the time thus consumed in moving the article from swage to swage is considerable, and does not enable the article to be formed at one heat of the metal, entailing a considerable expense and inconvenience.

By my improvements, the faces of the swages being in combination, and closely adjacent to each other, and connected to the same swage-bars, enables me to transfer the bar or rod of iron, or other metal under operation, from one

pair of surfaces to another in rapid succession, and with such economy of time as to forge and shape the article at one heat of the metal, and in a better and more uniform manner than by the ordinary means.

The surfaces of the pair of combined swages, as represented in one modification at figs. 5 and 6, are of a form intended to forge the central portions of flyers employed in machinery for spinning and doubling fibrous materials, but, of course, their form must be such as will produce the article intended to be produced.

I will now describe the manner of forging by this machinery the central portion of a flyer employed in spinning and doubling fibrous materials:—The bar or rod of steel or iron, or other metal from which it is to be formed, being heated to the required temperature, is taken by the workman from the furnace, and the end of it is placed between the swage surfaces at M, the lower swage is raised by the eccentric, K, by the workman moving the lever-handle, L; this forms in a rough state the boss of the flyer at a short distance from the end of the bar or rod; it is then removed immediately, and that portion of the bar between the end of it and the rough boss just previously formed is then drawn down by the surface or flat swages, F, F^1, to the desired diameter or size; it is then removed and placed at N, so that upon the descent of the upper swage by the action of the shaft above, and the ascent of the lower one by the action of the eccentric below, by the workman moving the lever handle, the end before drawn down, the roughly-formed boss, and a length of the bar or rod sufficient to form the second end of the flyer, will be cut off by the cutting surfaces of the swages from the bar or rod; the piece thus cut off is now taken up, and the second end of the flyer is then drawn down to the desired diameter or size, as the first one was, by the action of the surface or flat swages, F, F^1; it is then again removed, and placed between the swages at O, in such manner that the rough boss before made shall be placed directly over the recesses in the swage, so that upon the descent of the upper swage, and the ascent of the lower one, as before described, the metal will take the form of the recesses in the swages, and shape the boss of the flyer accordingly; the flyer thus forged may then be further drawn or swaged out, bent, and fitted in the ordinary manner; the whole of the above movements follow in rapid succession, so that the forging of the flyer is

effected whilst the metal retains a sufficient degree of temperature, without the necessity of reheating it to complete the operation, though it is not essential that it should be so, as, for very small flyers, or other like articles, it may be requisite in some cases to reheat the metal before the article is completely forged.

Having now described my said invention of improvements, and the manner of effecting the same, I hereby declare that what I claim as my said invention, and protection accordingly, to be as follows:—

The forging of steel, iron, or other malleable metals, to form the flyers of machinery employed in the spinning and doubling of fibrous materials, or other like articles, by means of swages or dies or hammers, each having two or more separate and distinct forms or surfaces, which perform or effect different and separate purposes in such forging operation to produce the article desired, and such swages, dies, or hammers being actuated or worked by mechanical means.—In witness, &c.

RICHARD LONGDEN HATTERSLEY.

Specification of the Patent granted to HIRAM BARKER, *of Manchester, in the County of Lancaster, Engineer and Tool Maker, and* FRANCIS HOLT, *of Manchester, aforesaid, Engineer, for Improvements in Machinery and Apparatus for Grinding and Turning Metals.*—Dated June 20, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our invention consists,

First, In an improved combination of parts for grinding metal balls to make them spherical.

Secondly, In an improved combination of machinery applicable to lathes for turning, for giving a reciprocating motion to the face-plate.

Thirdly, In an improved mandril or tool on which articles to be turned are fixed. And,

Lastly, In an improved combination of machinery for turning articles of a definite shape.

And in order that our invention may be fully understood, and readily carried into effect, we will proceed to describe

the means pursued by us, reference being had to annexed sheet of drawings, and to the letters and fi marked thereon.

Description of the Drawing.

Fig. 1, is a sectional elevation, and

Fig. 2, a plan, with the cover removed, of our imp combination of parts for grinding balls. *a*, is a chamber or dish, and *b*, is a lid or cover; groove turned in this dish and in the lid corresponding to the of the metal balls to be ground; these balls are m *c*, *c*, in fig. 2: and *d*, *d*, are blocks of wood or other su material placed between the metal balls to keep asunder. The lid, *b*, is furnished with a square shan in order that motion may be given to it by the spindle drilling machine, or in any other convenient manner. balls to be ground are taken in the state they leave foundry, and put into the groove of the dish, *a*; emery water, or other suitable grinding materials, are then a and the lid, *b*, is put on; rotary motion is then given t lid, and if the lid itself is not sufficiently heavy, pre must be given to increase the action on the balls t ground. It has been found from experience that six balls, of two inches in diameter, can be ground suffici spherical to act as valves of locomotive engine-pum six or seven hours, thereby producing a great savi labour, as such ball-valves are generally turned by han

Fig. 3, is an elevation, and

Fig. 4, a plan of our improved machinery for giv reciprocating motion to the face-plate of a lathe. *e*, i of the spindle of a lathe; *f*, the face-plate; and *g*, the shaft, to the end of which is fixed a slot-lever, g^1; this has an adjustable stud, g^2, the end of which takes i sliding-block, f^1, fitting in the slot-plate, f^2, bolted face-plate. When the lathe is in motion the back sh revolving imparts a reciprocating motion to the face- *f*, the amount of which can be increased or diminish bringing the stud, g^2, nearer to or further from the of the back shaft.

Figs. 5 and 6, represent two views of one of our imp mandrils. *h*, is a plate to be bolted to the face plat lathe; in this case the plate, *h*, is shown as forming p the conical arbor, *i*, on which fits the shell or bush, *j*, is cut open at j^1, and is forced on to the arbor, *i*, by the

j^2. When a wheel or other article to be turned is put on this improved mandril the outer diameter of the shell, j, must be such that the hole in the wheel or other article will fit easily on it; the workman, by then turning round the nut, j^2, forces the shell gradually on to the conical arbor, i, the action of which expands the split shell, j, and causes its outer cylindrical surface to fit tightly the hole in the wheel or other article to be turned; by this means much labour is saved, and the injury caused by driving the mandril into the hole of the article to be turned is avoided. By unscrewing the nut, j^2, the wheel or other article on the mandril is set at liberty. In some cases the screw and screw-nut may be dispensed with, and the shell tightened on the cone by a tube brought against and acted upon by the loose headstock centre; this mode of construction is particularly applicable for light work.

Figs. 7 and 8, represent two views of our improved combination of machinery for turning articles of a definite shape, such as the heads of screw-bolts, or the cutters for cutting the teeth of wheels, or other articles. l, is part of the bed of a lathe; m, is the socket of the common hand-rest; in this socket is supported the shank of the circular plate, n, which is provided with a lid, n^1; o, is a bar, which has a spherical projection on it fitting in a spherical recess in the plate, n, and lid, n^1; the shorter end of this bar has a cutter, o^1, fitted into it, and the longer end, which serves as a handle, is held in contact with and moved along the edge of the template or shaper plate, p, by the operator. This shaper plate, p, is bolted to a bracket, p^1, fixed by a bolt to the lathe bed, as shown in fig. 7. The distance of the shaper plate from the centre of the lathe can be varied by passing the bolt which holds it to the lathe bed through any of the other holes in the bracket, p^1. When the article to be turned has been fixed in the lathe, the attendant, by moving the long end of the bar, o, along the edge of the shaper plate, p, imparts a corresponding motion to the cutter, o^1, thereby turning the article in the lathe to the same shape as the template; but as the distance of the cutter to the fulcrum of the bar, o, is much less than the distance between the said fulcrum and the template, it is evident that the cutter moves through a proportionably less space, and consequently the article turned is reduced in size.

Having thus described the nature of our invention, and

the manner of performing the same, we wish it to be understood that we do not limit ourselves to the details herein set forth, as the same may be varied.

But what we do claim is,

First, the improvements described and shown in figs. 1 and 2, for grinding metal balls to make them spherical.

Secondly, the improvements shown and described in reference to figs. 3 and 4, for imparting a reciprocating motion to face plates.

Thirdly, the improvements in mandrils, as shown in figs. 5 and 6, and as described; and

Lastly, the improvements in turning articles of a definite shape, as shown and described in reference to figs. 7 and 8. —In witness, &c.

HIRAM BARKER.
FRANCIS HOLT.

Specification of a Patent granted to THOMAS MASTERS, *of Oxford-street, in the County of Middlesex, Confectioner, for Improvements in Apparatus for Freezing, Cooling, and Churning.*—Dated May 4, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention consists in so constructing the inner vessel for holding the materials to be frozen, cooled, or churned, in such a manner as to expose a large amount of surface to the freezing mixture, or to the liquid employed to facilitate the churning.

Fig. 1, of the drawings annexed, is a vertical section of a freezing machine. A, A, is an exterior pail, or other suitable non-conducting vessel, for containing the interior parts of my apparatus. This vessel may be made of china, porcelain, or earthenware, in which case it need be of such a thickness that the non-conducting substance can be dispensed with. Inside this vessel I place a second and hollow vessel, B, for containing water or other liquid to be cooled or frozen, and provide a tap, C, passing through the exterior vessel, by means of which the freezing mixture may be drawn off. In some cases, however, where liquids are not required to be cooled or frozen, I dispense with the second vessel. Inside the second vessel when employed, or when the second vessel is not made use of, then inside the outer

vessel, is placed the rough ice or freezing mixture, in which I place a vessel, D, provided with an inner conical tube, E. The mixture to be iced is placed in the interior of this freezing vessel, D; and it will be seen that the freezing mixture is brought in contact not only with the sides, but also with the centre or conical tube, whereby a large amount of surface is exposed thereto, whereby the cream or other matter placed in the vessel, D, becomes frozen in much shorter time than in the icing pails now ordinarily used. F, is a spindle which passes through the centre of the freezing vessel, and is provided with an agitator, G, for churning or stirring the rough ice or freezing mixture. The spindle, F, is provided with a forked spatula, H, for agitating the cream or composition to be iced. I, is a cover to the apparatus, through the centre of which the spindle is passed, which has fitted to it a crank handle, K, or other suitable means, for communicating rotary motion to the spatula, H, and agitator, G. When the freezing vessel is removed from the pail, the pail or outer vessel forms a wine-cooler.

Fig. 2, represents a vertical section of a freezing apparatus, similar to the one just hereinbefore described: but in this apparatus the freezing vessel, D, is so shaped as to form a mould for imparting an ornamental shape to the cream or other composition to be iced. The handle, K, instead of being placed upon the end of the spindle, is attached to one side of the cover of the freezing vessel.

Fig. 3, is a further modification of my freezing apparatus, in which the spatula, H, remains stationary, the requisite rotary motion being imparted to the freezing vessel, D, by means of the handle, K. The agitator, G, for churning or stirring the rough ice or freezing mixture, may also be formed with teeth upon its edge, similar to a spur-wheel; so that, in some cases, where it may be desirable to use several of the freezing apparatuses, they may be so arranged that the agitators may gear into one another, whereby the requisite rotary motion will be imparted to the whole through the motion given to that which has the handle or handles attached to it.

Fig. 4, represents this freezing apparatus combined with a wine-cooler; the centre conical tube is also only carried partially up in the interior of the freezing vessel, D. When the apparatuses are employed as a churn, instead of rough ice or freezing mixture being placed in the outer vessel, I

place there warm water, and place the cream to be churned in the vessel, D.

And having now described the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is, the several arrangements and construction of the inner vessels, D, of freezing, cooling, and churning machines, whereby a larger amount of surface is exposed to the action of the freezing mixture or other fluids or compounds for performing either of the operations of freezing, cooling, and churning, as hereinbefore described and represented in the drawings hereunto annexed.—In witness, &c.

THOMAS MASTERS.

Specification of the Patent granted to GEORGE MACKAY, *of Buckingham-street, Strand, Gentleman, for Improvements in the Manufacture of Glass.*—Dated July 5, 1853.—(A communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention of "Improvements in the Manufacture of Glass," relates, firstly, to the melting of glass. For this purpose a reverberatory furnace of peculiar construction is employed. This furnace is provided with a crown or arch, formed either of hollow bricks or of metal. Above the under surface of the arched roof of the furnace, a winding flue or a series of flues is constructed, and into these flues (which are pierced with small holes) air sufficient for a blast is forced, by means of any well-known blowing apparatus. These holes are constructed and arranged in such a manner as to direct the flame and gases of combustion downward upon the glass or the pots containing the same; and thus, while a powerful blast is directed to the glass, the arch of the furnace will be in a great measure protected from the action of the fire.

This invention relates, secondly, to the forming of plates of glass by causing the melted material to pass between two or more pairs of rollers set at different distances apart, and having different surface speeds. These plates, when formed, are retained between the rollers until cool enough

to hang in a vertical position without stretching, and they are then suspended by their upper edges in an annealing chamber.

In order, however, that this invention may be clearly understood, I have shown, in the accompanying drawings, the machinery and apparatus which I propose to employ to carry out the objects of the invention.

Fig. 1, is a longitudinal vertical section of a reverberatory furnace constructed according to the first part of the improvements.

Any of the usual pots for making plate-glass may be used, and I prefer to construct the reverberatory furnace in the following manner:—I turn the arch, *m*, of the furnace as low as is consistent, and form it of hollow bricks or even of metal, so as to form a kind of hollow roof. I make above this metal plate, or by means of the hollow bricks above the under surface of the arched roof of the furnace, a winding flue, *n*, *n*, *n*, *n*, or a series of flues, occupying a part or the whole surface of the arch; into these flues I force air sufficient for a blast by means of any well-known blowing apparatus, and along the surface of the arch I pierce the flues with small openings, *o*, *o*, *o*, *o*, so arranged as to cause the air from the flues to be forced downwards; by this means a stratum of air is brought between the roof of the furnace and the heated gases, and these gases and the heat therefrom are driven downward upon the glass and the pots containing the same. This blast has a twofold effect, as it supplies heated atmospheric air to produce the most perfect combustion of the gases, and forces the heat evolved therefrom downwards to the point upon which it is desirable to concentrate it, and it shields at the same time the roof of the furnace from the excessive heat, and prevents the vaporized fluxes and other material from attacking the roof and destroying it, as they are well known to do in many glass furnaces, to the great annoyance of the workmen and injury to the melting glass. This device, it is obvious, is applicable to other glass furnaces. In the drawing, this device is shown in one form merely, as an example, which may be modified as occasion may require.

The apparatus for forming plates of glass, as shown at figs. 2, 3, and 4, consists of a carriage composed of two side pieces, *a*, properly connected and placed on trucks, wheels, or rollers, *b*, on which it moves. This carriage, *a*, supports two or more pairs of rollers, *c*, (seen best in the

sectional view, fig. 3.) The second pair may be
nearer than those above them, so as gradually to
the thickness of the glass as it passes between them.

A hopper or receiver, *d*, called a "curvette," cont
the melted glass from the furnace, is located abov
upper rollers, so that by opening its bottom the gla
be precipitated directly between the first pair of rolle
the vessel containing the glass may be hung in a fra
that it can be turned up to pour the glass on to the
which by their revolution causes it to pass down be
them, as in fig. 3. The second pair can be made to
faster at their surface than the first pair, and the glas
thereby be drawn to any thickness. It is necessary
glass to be cool enough to sustain itself before it ente
annealing chamber, which forms the third improve
therefore the lower series of rollers are holding
simply. If the rollers are found to become too
heated they can be cooled to any degree by a curr
steam or water introduced into their interior through
journals, as is done in paper-drying machines and
others. One or more of the rollers can be embos
any desired pattern, which will be transferred to the
either for ornament or strength; or the cylinders may
perfectly plain, in order to produce smooth surfaces.

The annealing chamber, c, is rectangular and
of any dimensions; in the top of this chamber are a
of long narrow fissures, *f*, extending the whole bre
the chamber, which is equal to the length of the
Each of these openings is furnished with a clamp, *i*,
may be formed like a parallel ruler, as shown in the
ing, or in any other way found most convenient: it
set up by a screw, *k*, at the end, or other well-
device, so as to gripe the glass it is intended to
The annealing chamber is heated by air pipes con
with the furnace, by which a proper supply of heat
up in the annealing chamber. After the glass has
down through a sufficient number of holding roll
obtain a proper consistency to sustain its own weight
be polished by one or more sets of polishing rollers;
rollers, *x*, fig. 3*, and figs. 4, and 4*, can be for
wood or metal, and their outer surface covered with
pulverized charcoal, crocus, or other polishing su
used for polishing glass. The rollers receive a rapid
motion, and an endway motion is also given to th

means of the crank, *z*. They are kept pressed against the glass by springs, weights, or other contrivances, or they may, in certain cases, have no endway motion; there may or may not be other holding rollers below the polishers, but if there are such rollers interposed between the polishers and the annealing oven they must be highly finished and perfectly smooth on their surface.

To enable persons skilled in the art of manufacturing plate glass to use the present improvements I will describe the process of manufacture thereby:—The glass is made and prepared in the usual way, and then transferred to the hopper or reservoir, which is placed in a heating arch, where it is brought to the necessary temperature; when the glass is in a proper state the hopper is removed, and by means of cranes or other devices it is transferred to the carriage, which runs along a railway over the annealing chamber with its rollers parallel with the fissures therein. When directly over one of these openings the metal is caused to run between the rollers, as before named, and thence down into the annealing chamber. When a sufficient length has been run off into the chamber the clamp is closed upon it and the glass is broken off above; the carriage then passes on to the next opening and the same process is repeated. It is obvious that the carriage may be stationary, and the clamps made to move along the annealing chamber. The glass thus suspended maintains a perfectly straight position till annealed, and much labour is saved in the after process of grinding and polishing. Both sides can, if desired, be embossed and not be injured, as would be the case if they were made to lay on a bed or table. The glass manufactured by any known process can be suspended in the annealing furnace to be kept straight while cooling by this invention.

Having thus fully described the improved process of making plate glass and annealing the same, what I claim as this invention, and which I desire to secure by letters patent, is—

First, manufacturing plates of glass by causing the glass, after having been formed by rolling or otherwise while in a plastic state, to pass between two or more pairs of rollers for drawing and holding the glass till cool enough to support itself.

I also claim embossing the surfaces of plate glass

by passing it between embossing rollers, as above described.

I also claim the polishing rollers for polishing the glass before annealing, as herein specified.

I also claim the construction of the crown of the arch of a reverberatory glass furnace with an air chamber or chambers having downward openings to throw down the heat and vapourized materials, and thereby preserve the top of the arch and increase the effect of the fires.

And, lastly, I claim suspending plates of glass by their upper edges, after they have been formed, while annealing, so as to keep them in a perfect plane without resting on a bed.—In witness, &c.

GEORGE MACKAY.

Specification of the Patent granted to GEORGE EDWARD DERING, *of Lockleys, in the County of Herts, for Improvements in Electric Telegraphs.*—Dated August 15, 1853.

To all to whom these presents shall come, &c., &c.—The present invention is applicable to submarine telegraphs, and also to the means of communication by under-ground or over-ground wires. Heretofore, in constructing electric-telegraphs, where the whole circuit has been made of metal, and also where the conducting property of the earth has been employed as a part of the circuit, it has been usual, and it has been considered absolutely necessary, to cause the wires to be thoroughly insulated each from the others, and from the earth; the consequence of which has been, that the expense of laying down electric circuits for electric telegraphs has been very great, particularly where the same have crossed the sea or other waters, where not only have the wires been insulated from one another, and from the water or earth, but in order to protect the insulating matter from injury, great cost has been caused by the use of wire-rope or other means of protection. Now I have discovered that a metallic circuit formed of wires, either wholly uninsulated or partially so, may be employed for an electric telegraph, provided that the two parts of the circuit are at such a distance apart that the electric current, or a portion

of it, would meet with more resistance in passing from one wire to the other by the water, or the earth, or by imperfect conductors which the wires may be attached to or suspended from, than in following the wire. And for this purpose I cause the two wires (which may be of plain galvanized iron, either uninsulated, or partially insulated by a coat of varnish or otherwise), of which a circuit of an electric telegraph is to be formed, to be placed in the water, or in the earth, or otherwise conducted at a distance apart proportionate to the total length of the circuit. And I cause the wires to be insulated where they approach one another, to communicate with the instruments and battery or source of electricity, or with a continuation of conductors for carrying on the current, in order to prevent the current passing through the diminished space between the wires. And in the case of intermediate stations I insulate the wires for a distance in each direction from the instruments, in order to ensure the current making the circuit of the instruments, and not passing in a large proportion through the earth or water, or other conductors, between the uninsulated parts of the wire on each side of the station. The batteries employed to work telegraphs through circuits after these principles are to be constructed in the proportion of their parts, and in all respects, in conformity with the well-known laws which regulate the transmission of electric currents through circuits from which a portion of the current is diverted by intervening liquids or partial conductors, and the proper distance at which to place the conductors from one another is determined by the same laws; all of which will be readily understood by persons conversant with the principles of electrical science.

Another method of carrying out my invention consists in establishing electrical communication by means of circuits composed in part of the uninsulated or partially insulated conductors which I have described, and in part of the conducting property of the sea or other water, across which the communication is to be carried, or of the earth, or the moisture contained therein, in the case of land telegraphs. For this purpose, instead of establishing the connexions with the earth or water near to the extremities of the conducting wire, as when the ordinary insulated wires are employed, the connexion is effected at such a distance in a lateral direction from the conductor, that the current or a

sufficient portion of it would meet with more resistanc
passing direct from the earth or water connexion to
conductor, than in passing to the similar earth or w
connexion arranged at the other extremity of the line.
communication between the conducting wire and the e
or water connexion is to be effected at each end of the
by wires effectually insulated,—the same as described
reference to the communication by means of two di
metallic conductors, uninsulated, or partially so,—the
difference of the present arrangement being, that the
ducting property of the earth or water is employe
a substitute for one of those conductors. The conne
with the earth may be effected in the manner usu
telegraphs having insulated line wires. Or in some
plates of dissimilar metal or material may be employ
the two extremities, having a tendency to generat
electrical current when the circuit is complete, and
current may be applied to signalling purposes.
galvanic batteries may be employed as auxiliary to
desirable.

Another method of carrying out my invention consi
establishing electrical communication by placing in
earth or water two or more wires of dissimilar met
material, having a tendency to generate a current of
tricity by the action of the water or moisture with
they are in contact. If at one extremity the wire
attached respectively to the two ends of the coil
electro-magnet, or other telegraphic apparatus, it wi
found that this instrument is acted on by the elec
current generated by the wires. If now at the
extremity of these wires a direct connexion be establ
between them, a portion of the current generated w
once pass by this path, instead of passing round t
electro-magnet or other apparatus, and the action
will, consequently, at the same moment be dimini
and if means be adopted to indicate the greater o
power of the passing current, signals may thus be
mitted by making or breaking at pleasure the conn
at the opposite extremity of the wires. In order to e
signals to be transmitted from and to either extr
of the line, each extremity may be provided both wit
apparatus to indicate the passage of the current, an
means of making and breaking the connexion betwe

outstretched wires. And intermediate stations may be provided with similar arrangements, placed either in circuit of one of the wires, or so as to form a connexion between the two. The means of carrying out this part of my invention may be greatly varied, and, if it be desirable, electrical currents derived from galvanic batteries or other sources may be employed as auxiliary to those generated in the outstretched wires.

In the different means of communication which I have described, if strong conductors are required, as in submarine lines, wire-rope may be employed in place of the whole or any portion of the wire to conduct or generate the electrical current; or chains may be employed; or wires or wire-ropes may be protected from injury by being attached to chains, spirally or otherwise (and they will conduct the current more readily than the detached links of the chain); or they may similarly be attached to hempen ropes, or enveloped within them. The wire, or wire-rope, or chain, may be formed of iron, or copper, or any suitable metal, and coated with other metals, if desirable; and it may be coated with some suitable varnish, by which means the amount of exposed surface will be diminished, and the metal preserved from corrosion. The electrical currents to be employed as I have described may be derived from galvanic batteries, or by induction from magnets or currents of electricity, or from any other suitable source. I find in practice that from one-twentieth to one-tenth the total length of the line wires or conductors is an effective distance to place them apart from one another. And with regard to the currents of electricity employed, I find it advisable that they should possess the properties generally understood by the term "quantity" of electricity, in a considerably greater degree than is usual for telegraphing by insulated wires, which may be effected, if galvanic batteries be employed, by the use of plates of larger dimensions, or by other alterations in the exciting liquid or plates, as is well understood.

In order to explain more clearly the means of carrying out my invention, I will now suppose the case of a line to be carried out upon the principles which I have described: say a submarine line from Holyhead to Dublin, a distance of about sixty miles. For this purpose it would be necessary first to select two points on each coast at a distance

apart—say from three to six miles, and to unite toge
the two points on each coast by an insulated wire. N
the two northern points are to be connected together
submerged uninsulated conductor, and the two sout
points by a similar conductor, as near as may be parall
the first, unless the water be employed as a substitut
one of the conductors in the manner which I have descr
Thus an oblong parallelogram of continuous condu
is formed, having for its longer sides the uninsulated
ductors, and for its shorter sides the insulated wires
the coast. And if now the coast wires on each sid
divided at any parts, or disconnected from the sea
and batteries introduced into the circuit, signals ma
transmitted by any of the means ordinarily employed
insulated line wires. Or, to take the case of a longer
suppose it were desirable to unite Great Britain
America, I should select two points in each count
a sufficient distance apart from one another—say the L
End in Cornwall, and the Giant's Causeway in Irelan
some suitable point on the west coast of Scotland,
corresponding points on the American coast. Ne
should unite the two points in each country by insu
wires, and finally submerge two uninsulated condu
across the Atlantic; or one, if the water be employ
complete the circuit. Then by introducing telegr
instruments and batteries into the circuit of the land
the communication will be established.

And I would observe, that for crossing wide seas su
the Atlantic, where difficulties might arise as to the st
of a sufficient length of conductor, my plan possesses
liar advantages, inasmuch as the space ordinarily occ
by insulated wires is avoided, and at the same time
equal strength is obtained, and thus a far greater len
line may be coiled in the same compass. And I b
that in deep water, beyond the reach of ships' an
a single wire will effectually answer for each cond
provided it be of good material, and sufficient stren
bear the strain of laying down. The method of ca
out the various modifications of my principle, and its
cation to land telegraphs will be readily understood
the examples which I have here given.

From the foregoing description, it will be seen th
cost of laying down electric telegraphs, whether subm

or otherwise, is, by this invention of employing distance between the conductors as a means of insulation, reduced to little more than the mere cost of the conductors for the current, together with that of an insulated wire at each end of the line, to complete the circuit between the extremities of the uninsulated conductors; and the numerous difficulties which attend the insulation of long lengths of wire are avoided, as also the chances of the communication being interrupted by accidents to the insulation.

And having thus stated the nature of my invention, I wish it to be understood that I do not confine myself to the details of the description which I have given.

But what I claim is, the use of the element of distance between uninsulated, or partially insulated, wires or conductors, as a means of insulation for telegraphic purposes; whether such wires be employed merely as conductors, or also as generators of electrical currents, and whether or not the conducting power of the earth, or the moisture thereof, or any body of water, be employed as one conductor.—In witness, &c.

GEORGE EDWARD DERING.

Specification of the Patent granted to CHARLES TOWNSEND HOOK, *of Tovil House, Maidstone, in the County of Kent, for Improvements in the Manufacture of Pulp.*—Dated September 14, 1853.

To all to whom these presents shall come, &c., &c.—The invention consists of an improved method of distributing chemical and other solutions over the surface of fibrous substances when about to convert them into pulp: for this purpose I employ an iron or other vessel, preferring it to be of a cylindrical form, and of about twelve feet diameter and five feet deep, but these dimensions may be varied. This vessel has a cover and perforated false bottom, and it has a standard fixed upright in its centre; supported by this standard and working in a bearing at the top thereof there is a tube revolving horizontally, a few inches below the level of the top of the side of the vessel, and made long enough beyond each side of the standard just to clear the interior sides of the vessel; this tube has

narrow slits cut in its under surface in the directi
its length, increasing in width as they approach the
and varying, say from one-twentieth inch next the c
to one-fifth inch next the outer ends; care shoul
taken that where the tube is left blank in one ar
projection beyond the standard at the same distance
the outer end of the other arm there shall be a slit
vice versa; or in place of slits the tube may be pierced
numerous small holes, increasing in number or size as
approach the outer ends of the arms. At the cent
this tube is a branch tube or pipe, fixed upright a
a right angle to the horizontal one, which is conti
through the cover of the vessel to allow a bevel or
wheel to be keyed on it in order to its being drive
another wheel in the usual manner, or it may receive m
by a pulley and strap or otherwise. This upright
terminates in a stuffing-box, which connects it with a
pipe, the other end of which is connected with a v
which I prefer to be of about forty gallons' capacity, p
above the level of the distributing tube, but as little
conveniently may be. This vessel I call the heater, a
is fitted with a coil of pipes to be filled with steam,
double bottom and sides may be used, in order to kee
solution employed at a boiling temperature. A pipe
from the bottom of the vessel containing the fibrous ma
under process to a pump; I prefer one that will lift
seventy to one hundred gallons per minute when the
is of the dimensions above given. This pump elevate
liquor as it comes below the false bottom into the "he
above. There is a cock or valve on the pipe leading
below the false bottom of the vessel, to draw the liqu
when desired. The apparatus having been constructe
arranged as described, the mode of working is as fo
supposing straw to be the fibrous substance operate
and it is a very suitable material for the purpose, tl
the process is available for other fibrous substances:—

The straw having been cut into lengths from ab
quarter to three-quarter inch, and as much dust, l
corn, &c. removed from it as possible by sifting and
ing, or by other similar means, is then placed int
vessel with a false bottom, which is filled to within
inches of the distributing tube, which is then put in n
at a rate of from five to ten revolutions per minute.
steam is then turned on to the "heater." From twe

fifteen gallons, to each hundredweight of straw operated on, of boiling alkaline liquor is introduced into the "heater," which will be quickly showered down from the two arms of the horizontal tube over the straw; this first quantity may be liquor which has been previously used on a like quantity of fibre. A boiling solution of fresh caustic soda or potash, otherwise hydrates of soda, or potash, of a strength of from eleven to fourteen degrees Beaumé, is next introduced into the "heater," and is quickly dispersed over the straw. I would remark that it is not essential that the used alkaline solution and the fresh hydrate should be kept separate; they may, if preferred, be mixed in a receiver before using. When the necessary quantity has been distributed over the straw (which will be from twenty-two to twenty-eight gallons for every hundredweight of straw in the vessel) the pump is to be set to work, by which the liquor collected below the false bottom will be elevated into the "heater," and from thence it is showered down by the distributing arms over the surface of the straw. This action is continued from eight to twelve hours. The distributing tube is then stopped. The pump is then caused to lift a sufficient quantity of the liquor for the next operation (say twelve to fifteen gallons for each hundredweight) into a receiver above, and is then stopped, the valve at the bottom of the vessel is opened, and the liquor drains off from below the false bottom. A supply of hot water, about forty to fifty gallons to each hundredweight of straw, is then furnished to the "heater," whence it is showered down on the straw. The steam is shut off from the "heater," and cold water is showered down till the liquor drains off clear. Sulphuric acid is added in the last 200 gallons of cold water at the rate of about two gallons to one ton of straw, which improves the colour.

The remainder of the alkaline liquor drained off from the straw and a portion of the hot washings should be evaporated and the product burnt in a furnace or oven, by which a portion of alkali may be regained. The straw is then emptied into a "poaching engine," where it is bleached in a solution of bleaching powder of about a strength equal to two degrees Beaumé, or a steeping chest can be used with a less quantity of bleaching solution, but which should be of a strength of about three degrees Beaumé. This must be stirred often. I find straw to take a longer time in bleaching than rags. It is then well

washed and drained, and put into a beating engine, which quickly converts it into a pulp. I have found it best to keep the straw or other fibre at a temperature of from seventy to eighty degrees Fahrenheit while bleaching.

I do not confine myself to the details above stated so long as the peculiarity of my invention is retained.

What I claim is, the mode above described of distributing chemical solutions and water over the surfaces of fibrous materials suitable for making pulp.—In witness, &c.

CHARLES TOWNSEND HOOK.

Specification of the Patent granted to MOSES POOLE, *of Avenue-road, Regent's Park, in the County of Middlesex, for Improvements in Regulating the Flow and Pressure of Gas and other Fluids.*—Dated August 8, 1853.—(Communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—It is often desirable to deliver æriform fluids at a certain uniform pressure, and various means have before been resorted to for effecting this object. And the present invention consists of combining the use of two or more governors or regulators, which, acting independently and in succession, more completely accomplish the desired object than has heretofore been done. The description of governors or regulators which are preferred for this purpose are those where inverted vessels are used, working in quicksilver or other fluid, and connected to the induction valves. Supposing the apparatus to be arranged for regulating the supply of gas or other æriform fluid, the main or supply-pipe, where the regulation is to take place, is arranged to communicate in succession with two or more chambers, each having a governor or regulator, and so that no gas can pass from the main or supply-pipe to the furthermost chamber without having passed through, and been regulated more or less perfectly by, the previous regulators or governors, by which means the gas, supposing it to come up to the first governor or regulator at a pressure exceeding that at which it is desired to deliver it at, will act on the governor, and tends to close the valve, and thereby restrict the passage

of the gas into the first chamber; the gas then passes from the first chamber or governor into the second, and, if it be still at an excessive pressure, it will be again retarded in its passage, and so on, according to the number of governors or regulators combined and caused to act in succession.

Having thus stated the nature of the said invention I will proceed to describe the manner of performing the same.

Description of the Drawing.

The drawing shows a vertical section of an apparatus combined according to the invention, having two regulators or governors acting in succession, but other apparatus may be made with more than two to act in succession in a similar manner. The form of regulator or governor preferred is that where an inverted vessel is employed fixed to the valve, the action of which is to be regulated; but the form of the parts may be varied, so long as two or more regulators or governors are combined to act in succession as herein shown and described. No claim, however, is made to the governors or regulators separately when two or more are not combined to act on and regulate the same supply. A, is the inlet for the gas or æriform fluid; B, is a chamber, the opening, C, C, out of which is capable of being more or less closed by the valve, O, which is on the stem, F, to which the inverted vessel, D, is fixed, the edges of which dip into mercury or other suitable fluid at E, E, there being weights, G, G, on the vessel, D, according to the degree of pressure it is desired to regulate or bring the supply of gas or other æriform fluid to, when it passes away at the outlet, K. The gas or other æriform fluid coming into the chamber, B, (above the desired pressure) will to some extent be regulated by its acting on the first regulator by raising the vessel, D, which will also raise the valve, O, in the compartment, B, towards the opening, C, C, till the quantity of the gas allowed to pass into the chamber, H, of the apparatus will be brought to nearly the desired pressure. The gas or æriform fluid in the chamber, H, passes through the opening, J, J, into the compartment, K, and acts on the inverted vessel, L, (which is affixed to the stem, N,) by which the valve, O, in the chamber, H, will be more or less closed, according to the pressure of the gas or æriform fluid in the chamber, H, is more or less an excess of the

pressure that it is desired the gas or æriform fluid should go off at the outlet, K.

I would state that usually the same amount of pressure or weight, N, N, is applied to the inverted vessel, L, as there is by the weights, G, G, to the vessel, D, such being believed to be the best mode of working when using such apparatus. The vessel, L, like the vessel, D, dips into mercury or other liquid at its lower edges. By reason of using a succession of regulators or governors, any want of correctness of the regulation of the first will be compensated for by the succeeding one or ones.

Having thus described the nature of the invention, and the manner of performing the same, I would have it understood that what I claim is, the combining two or more governors or regulators so that they may come into action in succession.—In witness, &c.

MOSES POOLE.

Specification of the Patent granted to EDWARD HEARD, *of Regent-street, Kennington, in the Parish of Lambeth, in the County of Surrey, Practical Chemist, for A Certain Composition or Mixture of Chemical Agents for rendering Sea Water fit for Washing, and Softening Hard or Spring Water for the same Purpose.*—Dated August 24, 1853.

To all to whom these presents shall come, &c., &c.—As sea water on analysis is found to contain and hold in solution certain neutral salts with the earthy bases of magnesia and lime, their constituent acids decompose the common soaps of commerce wherever they are used for washing in sea water—unite with their alkalies and separate the sebaceous matter or fat, which prevents the perfect detergency or cleansing of garments, leaving a minute deposition of those earths on the surface and interstices of the articles intended to be washed, which no subsequent rinsing in sea water can entirely remove, and thus from their deliquescent properties occasion the dampness felt by those who wear them. Now, in order to prevent such disagreeable effects, and adapt sea water for washing with any

of the common soaps in use, I employ the following composition or mixture for that purpose:—

I take the common soda of commerce, as being the cheapest of the two alkalies of soda and potash, (although either will do,) and boil or evaporate its water of crystallisation in an iron pan or other suitable vessel, applying either steam-heat or that of a naked fire, as may be most convenient, and reduce the salt to dryness, keeping it constantly stirred during the operation to prevent incrustation, or adhesion of the salt to the bottom or sides of the evaporating vessel. When brought to this state of desiccation it is ground in a mill, similar to what is used for paints or colours, and thus reduced to a fine powder. It is then mixed with fresh slaked or hydrate of lime, previously prepared by passing it through a fine wire sieve; the proportions used of this earth to a given weight of the alkali may range from one-fourth to one-half of its weight, but I have found one-fourth part generally sufficient for the purpose.

These ingredients are next to be well mixed together by passing them again through the above-mentioned mill, or by any other mechanical means best adapted for effecting the most perfect and uniform combination.

The quantity or weight required of this preparation to a given measure of sea water may be in the proportion of one pound (avoirdupois) to three gallons of sea water, but as this latter may differ in strength or quality in different latitudes, more of the composition may be added until the water feels quite slipping and soft to the hand.

It is essentially requisite that it be well mixed or stirred together for at least half an hour in order to effect a perfect decomposition of the earthy salts. It is then suffered to subside, and when the supernatant water is quite clear it must be drawn off carefully from the precipitate, either by pouring, decantation, filtration, or syphon, or any other mechanical means best adapted for the purpose. The clear prepared sea water is then fit for washing.

I claim, therefore, the composition above described for rendering sea water fit for washing, as well as softening hard or spring water for the same purpose, according to the directions given.—In witness, &c.

EDWARD HEARD.

Specification of the Patent granted to THOMAS CHARLES MEDWIN, *of the Firm of Medwin and Hall, No. 92, Blackfriars-road, Engineers, for Improvements in Steam-Boilers.*—Dated August 23, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object two improvements in steam-engine boilers:—

The first, consist of applying a coiled tube within the fire tube or flue passing through a steam-boiler, one end of such coiled tube being connected with the boiler, and the other end connected to the feed pump, and also having a cock, by which the coiled tube may be blown through when desired.

The second improvement has for its object the obtaining a more convenient fixing of the steam cylinder and working parts of the engine to the top of a boiler, for which purpose the upper part of the boiler is made hollow or concave, so as to offer a hollow channel to the extent of about half the diameter of the steam cylinder, and the steam cylinder is provided with brackets to fix the cylinder partly within the concave part of the boiler, and the connecting rod and crank work within and above the hollow or concave upper part of the steam-boiler.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a longitudinal section of a steam-boiler, constructed and arranged according to my improvements.

Figs. 2 and 3, are two transverse sections taken respectively at the red lines, E, F, and G, H, in fig. 1, which itself shows a section taken at the red line, A, B, in fig. 2; and

Fig. 4, shows a longitudinal section taken through the red line, C, D, in fig. 2. In each of these figures the same letters of reference are used to indicate similar parts. *a*, is the main tubular flue through the boiler, in the front end of which is formed the furnace and ash-pit, as shown; *b*, is the return-flue, also through the boiler; and I would

state that the form of the boiler with its flues, *a*, *b*, shown in the drawing, with the exception of the parts hereafter described, is similar to steam-boilers heretofore made; and I would also state that the shape of the boiler and the arrangement of the flues may be varied, and yet have my improvements applied thereto; *c*, *c*, are coiled tubes, one in each flue; one end of each of the tubes, *c*, opens into the boiler, and the other ends are connected together, and to the supply pipe, *d*, leading to the pump; and there are cocks, *e*, *e*, applied to such pipes, to allow of part of the water in the boiler being blown through the pipes, *c*, *c*. By the application of the pipes, *c*, *c*, in this manner within the flues of a steam-boiler, the water entering or fed into the boiler will be heated in its passage from the feed-pump to the boiler.

The form of the tubes, *c*, *c*, may be varied, and it should be understood that I do not claim the heating of the water supplied to a steam-boiler; this part of my invention consists of the application of tubes into the flues of steam-boilers, as above explained. It will be seen that the upper part of the boiler is formed with two recesses, the one to receive the cylinder and the other to admit of the rotation of the crank. The cylinder may thus be let into the boiler, and by its having suitable flanches and brackets, as at d^1, d^1, may be fixed thereto, as is shown. Any desirable degree of concavity may be made in the boiler to receive the cylinder of the engine, but I prefer that the hollow should not exceed one-half the diameter of the cylinders. And it will be evident that where an engine is to consist of two cylinders, a suitable recess may be made to receive the two cylinders; e^1, is one of the two side framings and guides for guiding the end of the piston rod; this frame is fixed to the cover of the engine, also to the boiler, and to the bearings, *f*, of the main shaft, such bearings, *f*, being affixed to the boiler on either side of the recess, *g*, made in the boiler where the crank rotates.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I make no claim to any of the parts separately, nor do I confine myself to the precise details.

But what I claim is,

First, the application of tubes, *c*, in the flues of steam-boilers; and

Secondly, I claim constructing steam-boilers recesses for receiving the engines and for admitting the tion of the cranks, as herein described.—In witness, &c

THOMAS CHARLES MEDW

Specification of the Patent granted to RICHARD DUC KAY, *of Bank Terrace, Accrington, for Improvemen Block Printing.*—Dated September 14, 1853.

To all to whom these presents shall come, &c., & My invention consists of a new mode of shading, mixin blending colours used in block printing.

Several methods have been practised for "rainbow technically speaking, *i.e.*, producing shaded effects in l printing. all of them more or less tedious and exper and limited in their application, requiring friction, m nical agency, or skilled labour, to produce the de result.

Methods are also in use for printing several colou one application of the block (technically termed "tobyi but these colours have been invariably plain, not sh and the object has been to keep one colour separate distinct from another.

I propose to unite or mix the colours in regular or nite proportions by modifying the ordinary "toby" a ratus, and thus to obtain all the effects produced b usual methods of "rainbowing," and many more, considerable economy of time, labour, and general exp

The following is the description of my apparatus:—

Description.

I take a piece of wood, of dimensions varying acco to the size of the block to be used in the printing. H planed this wood to a true surface, I take the block w has the pattern upon it to be shaded, and print an im sion of it on the said wood, in any colour or substance will show clearly the pattern on the wood. I then c hole in the wood, of the shape thus indicated by the b and I divide this hole into two parts by a slip of woo other suitable material, and, having made the top of

ı level with the surrounding part of the wood, and also formed a channel from each division of the hole, ıting at one end of the wood in two separate orifices, a layer of resin or other adhesive and impervious ıce equally over the surface of the wood, and while a state of fusion I lay over it a piece of flannel or uitable fabric, and then surround the hole on the surface of the flannel with a line of resin or other substance, to retain the colour within certain The resin having had time to cool and to adhere o the flannel, the apparatus is complete.

ɔceed to work by introducing two colours into the ivided and covered with flannel, as explained), by of the channels communicating with this hole. I -half of the hole with a dark shade of colour, and ɛr half with a pale shade of the same colour. There ıion of these two colours till they have both risen to ɛrior surface of the flannel covering the hole. When colours have made their appearance on the upper of the flannel, and a union of the two has taken take the block which I use for printing an impres- on the wood, and apply it to the hole (now covered nnel, and supplied with colour, as explained), and it to the cloth which is to be printed.

obvious that two shades of the same colour, more or ıded together, will thus be conveyed to the cloth. ɜh it distinctly understood that I do not by the escription mean to tie myself to one division, or to ours, in one hole. I propose to use as many divi- colours in one hole as I may think proper, and as these holes as may be necessary, each hole contain- same or totally different colours.

ıer, I do not intend to limit myself to a straight of the colour-hole; on the contrary, I propose to ıetimes a curved or irregular division, as may be proper to suit the peculiarity of the pattern.—In &c.

RICHARD DUGDALE KAY.

Specification of the Patent granted to SAMUEL CLARKE, *of No. 55, Albany-street, Regent's Park, in the County of Middlesex, Lamp and Candle Manufacturer, for Improvements in the Manufacture of Candles.*—Dated October 27, 1852.

To all to whom these presents shall come, &c., &c.—This invention consists of causing the tips or the wicks of candles to be prepared in like manner to matches, so that they may be ignited in like manner to matches.

And in order that my said invention may be more fully understood, and readily carried into effect, I will proceed to describe the best means I am acquainted with for performing the same.

I prepare the following composition:—Fifteen parts by weight of chloride of potassa; six parts by weight of white sugar; six parts by weight of hard-pressed acidified fat, or spermaceti; and one and a-half to two parts by weight of amorphous phosphorus, which may be procured in the state of powder: the other materials are to be finally ground into powder. The first above-mentioned ingredients are to be mixed with sufficient gum-water to render them into a paste-like consistency, the powder of amorphous phosphorus being added last, and the whole is to be well stirred and ground together, care being taken not to bring the chlorate of potassa and the amorphous phosphorus together when dry, otherwise an explosion might take place. The tips or ends of the candles are to be dipped in this preparation, and dried thoroughly, and in this state they will ignite by high temperature, without requiring a flame, in like manner to brimstone and to some other matches.

I would remark that I make no claim to the preparation of the materials above described, nor do I confine myself thereto, as other compositions which will ignite in a similar manner, and such as have been employed in the preparation of matches, may be used; but I prefer the above, as the same is not too readily ignited, the object of my invention being to manufacture candles in such manner as not to require the application of a flame to light them.

And what I claim is, the manufacture of candles with wicks prepared so as to light in the manner of matches, as herein explained.—In witness, &c.

SAMUEL CLARKE.

Specification of the Patent granted to JAMES HIGGIN, *of Manchester, in the County of Lancaster, Manufacturing Chemist, for Improvements in Printing or Dyeing Woven or Textile Fabrics, and in the Manufacturing of Certain Substances to be Used in the Arts or Processes of Dyeing and Printing.*—Dated May 14, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists in the substitution of silicates of the alkaline earths diffused in water for cow-dung in that operation in calico printing termed "dunging." It was discovered by Mr. Mercer, of Oakenshaw, in the County of Lancaster, that the introduction of silica into mordants, so as to produce silicate of iron, or silicate of alumina, was of great benefit to the dyed colour, for which discovery he obtained royal letters patent, dated the 22d June, 1846, in the specification of which he describes a method of so preparing calico, that when the ordinary mordants were applied the silica in the calico seized the bases of the mordants and formed silicates of those bases. This method has certain inconveniences, and in October, 1852, a Mr. Herm Jäger obtained Her Majesty's royal letters patent for another method of obtaining silicated mordants on cloth by substituting a solution of silicate of an alkali for cow-dung in the dunging operation, whereby a precipitation of silicates of iron or alumina took place in the fibre. From the alkaline reaction of the silicated alkali it has been found that the process is not always to be depended upon, and that the alkali is very apt to dissolve some of the alumina in the red and chocolate mordants. To meet and obviate this objection, I now propose to use a silicate of an alkaline earth, lime by preference, which, being formed by precipitation of the silica in combination with the alkaline earth, is not open to the objection of being a solution capable of dissolving the alumina of the red mordants. The following is the method I employ:—I fuse in a reverberatory furnace a mixture of sand and soda ash, or carbonate of soda, in such proportions that the resulting glassy substance is as nearly as possible a combination of two equivalents of silica and one of soda. I then dissolve this substance, and bring the solution to a certain density, say fifty degrees, in Twaddell's Hydrometer. On the other hand, I make a solution of muriate of lime in any convenient manner, and set at fifty

degrees, Twaddell having by analysis found the quantity silicate of soda and the quantity of muriate of lime i gallon of each of the liquids. I form a dunging bath adding to the hot water in the dunging cistern the solutions, in such proportions as that there shall be a sl excess of muriate of lime in solution. By the do decomposition which ensues there is formed bisilicat lime, which separates as a precipitate, and muriate of remains in solution. The goods are passed through mixture in the usual manner, and at the usual heats, afterwards treated just as if they had been dunged cow-dung. The proportions I have found useful ar hundred gallons of water and one gallon of each o solutions, generally putting muriate of lime in the first; but the proportions will vary according to the pa of the printed goods, observing only always to add th liquids in such proportions that there shall be no silic soda or potash in solution. Where there is a us caustic soda, the silicate of lime may be conveniently cheaply formed by adding slaked lime in fine powde solution of silicate of soda, stirring it well. The unites with the silica, and caustic soda remains in sol When settled and clear, the soda is run off, and the si of lime washed free from soda. In this state it can be in dunging, by adding it to the dunging cistern in any venient proportions.

Having thus fully described the nature and particul my said invention, I desire it to be distinctly under that I do not claim the preparation of silicate of soda do I confine myself to the particular silicate of lime, h described, as it may be possible to form silicates o alkaline earths in a variety of ways without departing the principle of my invention.

But what I claim is, the use of a silicate of an alk earth diffused in water in place of cow-dung in the du operation, as herein described.—In witness, &c.

JAMES HIGG

Specification of the Patent granted to WILLIAM PIDDING, *of the Strand, in the County of Middlesex, Gentleman, for Improvements in Treating Sheets of Caoutchouc or Gutta Percha, so as to render the same fit for Ornamental Coverings.*—Dated March 9, 1853.

To all to whom these presents shall come, &c., &c.—I take a sheet of india-rubber (caoutchouc) of such thickness as I may require (which will be determined by the purpose of covering for which I intend to use the fabric or material when completed), and stretch it, by any known means, to from eight to sixteen times (more or less, as desirable) its original superfice; I then print thereon a design or pattern, by any mode of printing, whether block-printing or by cylinder. This design or pattern is made to show on its surface equidistant dots, or dots printed according to the design to be used. Each of these dots must be perforated by any known means, such as needle points, punches of angular points, or any other formed points; and such are to be used by hand, or upon forms or cylinders, where the latter are capable of being used for the purpose. As there is no novelty in any part of the machinery or apparatus used by me in the course of my operations on caoutchouc or gutta percha, it is, I conceive, needless to illustrate such mechanical means by annexing drawings to the Specification. Into each of the holes perforated in the caoutchouc, as aforesaid, I introduce a stud, or other formed substance, angular, sexagonal, octagonal, or otherwise shaped, of any convenient size, or of any suitable material, as electroplated substances, silica, glass, glazed metal, metal or other substance. On withdrawal of the stretching-press or frame, the sheet of india-rubber will collapse to, or nearly to, its size before stretching. The studs, or other formed substances, being retained by the increased pressure of the caoutchouc, and drawn closely (or nearly so, as may be preferred) together, will present a surface of glass, steel, or other coloured substances, either in design of various patterns and substances, or plain of one substance, as may be preferred; and this fabric will be found fit for covering shoes, boots, ottomans, carpets, ornamental hangings, and for other useful and ornamental purposes. I effect closer adhesion of the caoutchouc and ornaments by boiling the fabric in water, where desirable.

Or, instead of studs, I insert into the holes aforesaid threads of any material, drawn as minutely as possible, previously soaked in gelatine, or any proper adhesive substance, and allowed to dry; then cut into the required lengths, and pass them, when thus prepared, through the holes in the caoutchouc aforesaid. I then relieve the threads from the adhesive substance, by using such solvents as their nature may require. I also produce uncut pile, on india-rubber grounds, by taking a sheet of caoutchouc, of any length and width, which I greatly distend, and pass between two or more sets of rollers. The external surface of the first rollers (set off) is cut into grooves, equidistant and longitudinal, or otherwise: these rollers are to be supplied by other rollers or apparatus, with sufficient adhesive substances in solution, together with the length of india-rubber already mentioned. I pass threads, yarns, spun glass, or other substances, and when, by pressure and adhesion, the two are well connected, the moisture (adhesive solution) is thrown off. When the india-rubber contracts, the fabric will be an uncut pile on one or both sides thereof. Any design or pattern may be produced on these fabrics. The pile, in all the before-described fabrics, can be cut, ground, or shorn, according to the nature of the material of which pile is composed. Instead of using sheets of india-rubber alone, I use sometimes a combination of caoutchouc and gutta percha in sheets, or gutta percha alone; in the latter case, of course, the flexibility of the material being less, the holes would be made closer to each other.

Having now described the mode or modes of carrying my invention into practical effect, I would observe that I lay no claim to the use of any of the materials or substances mentioned in this my specification, when considered or taken separately, but only when used in combination, as hereinbefore directed, for the purpose of fitting such combination of materials or substances for ornamental coverings.—In witness, &c.

WILLIAM PIDDING.

Specification of the Patent granted to JOHN WALLACE DUNCAN, *of Grove End-road, St. John's Wood, in the County of Middlesex, Gentleman, for Improvements in Adhesive Soles and Heels for Boots and Shoes, and in Apparatus used for Preparing and Applying the same.*— Dated July 16, 1853.

To all to whom these presents shall come, &c., &c.— My invention of improvements in adhesive soles and heels consists in the adaptation of suitable waterproof cement applied preliminarily for an adhesive surface upon soles and heels, which at natural temperatures are free from stickiness, and rendered suitable as articles of commerce.

In this condition, the material (when of proper size) only requires to be heated to the necessary degree for becoming sticky, and applying to the bottom of boots and shoes, &c., without the use of any solution or other cement, when they will adhere and become fast, after cooling down to a natural temperature.

The cement which I employ for the purpose is by preference that secured to me by Her Majesty's Royal letters patent bearing date the 14th day of April, in the year of our Lord 1853, and described in the specification filed on or about the 14th day of October, in the year of our Lord 1853, and pointed out for the purpose.

I do not confine myself to the use of this cement, as other cements may be used without deviating from the character of my invention. The cement may be coated upon the material or substance of the soles or heels by apparatus described in the specification of the above-mentioned letters patent, although any other suitable method may be adopted, and the cementing matter applied either as an entire or partial coating alone or combined with thread, wire, woven fabrics, fibrous materials, or other matters found advantageous, upon the proper surface, or in spots, holes, grooves, or chequers.

The material for the substance of my improved soles and heels may be leather of any suitable description, gutta percha, caoutchouc, cattimundo, gum muddar, or other compounds (in any condition of treatment), either alone or combined with fibrous materials, textile or woven fabrics, cork, wood, horn, metals, glass, or earthenware.

Another of my improvements in soles consists in making

goloe soles of a length and width sufficient to encase the lower part of the boot or shoe to which they are intended to be attached. A vamp or welt-piece is formed all round the entire sole, rising from the edge; it is made contracted all round the top, so as to incline towards the middle, and high enough to embrace the lower part of the upper leather of the boot or shoe. These goloe soles may be formed of any suitable material, such as sole-leather, cork, wood, metal, caoutchouc, in any state of vulcanization, or combined with woven or fibrous material; the rising edge is made of a more flexible substance than the bottom, in order to grip and be easy to the foot. I prefer these soles to be manufactured of a combination of woven material with gutta percha or its compounds, after being treated according to the process secured to me by Her Majesty's Royal letters patent, bearing date September 4, 1851, and described in the specification thereof enrolled in Her Majesty's High Court of Chancery on or about the 4th day of March, 1852, which consists in "subjecting gutta percha in a state of mastication to the action of hot air, regulating the temperature gradually from 200 degrees to about 350 degrees Fahrenheit, and continuing it for several hours, according to the quality of the gutta percha, in order to dispel the natural moisture from it." "This, if properly effected, renders articles made of that material less liable to change from atmospheric influences," or what is generally understood by vulcanized.

For facility and superiority of manufacture these soles may be constructed in moulds for the purpose, adapted to any machinery for "automically elaborating, moulding, and consolidating progressively gutta percha and its compounds," also described in the specification of patent last time hereinbefore referred to. In moulding soles, &c., I use hot water of a high temperature circulating in the jacket round the mould-column of the said apparatus, while the hot moulds containing the gutta percha compound are slowly progressing towards the top. The requisite parts of the moulds may be engraved or chased to ornament the articles as desired; and soles or heels may be made of an elastic or hard compound, according to the proportions of the vulcanizing matters combined, and degree of heat or length of time they are subjected to while in the moulds.

Gutta-percha sheet, manufactured as pointed out in my specification filed on the 14th day of April, 1853, may be

used for making my improved soles, according to which the material consists of rolled band of gutta percha and its compounds. Gum muddar or its combination are also applicable, and may be perforated, embossed, and cut out at one operation from that form of material.

I make soles of leather, hardened sulphurized caoutchouc, or gutta percha, or other material, perforated and combined with elastic vulcanized gutta percha or caoutchouc, disposed so as to protrude through perforations and appear in relief, so that the weight of the wearer may be sustained upon the elastic portion of the compound soles next the ground. I prepare thick cork soles and heels, hooped or not round the edge with leather or gutta percha coated with an adhesive surface, to attach to boots, shoes, or goloshes for wear during wet weather. Any of these descriptions of soles and heels I prefer to ornament by printing or stencilling various designs with adhesive cement upon the wearing face, and applying thereon either coloured flocks, powdered colours, metal powders, or leaf.

I do not restrict myself to the use of sole-leather manufactured by any particular method, but for facility in procedure I prepare and condition the leather by machinery, as hereinafter described, previous to passing it under my coating apparatus to receive the charge of cement; when the cement cools it may be perforated and embossed as desired, if not so treated previous to coating, and then cut out in suitable shapes for soles and heels by machinery actuated by steam power or otherwise.

In order to condition and prepare leather, I pass it through one or more pairs of rollers or cylinders geared and mounted in suitable framing; the upper one of the pair is constructed with the surface studded with convex projections, the other having a plain surface. The action of these rollers is to expand the leather to its utmost limit, and render it dense and firm (when passed between them in a damp state the effect is similar to that produced by the shoemaker hammering the leather upon the lapstone); it is then dried, and subsequently treated according to the other part of my invention. In order to surface leather and prepare it to receive the cement, I use a machine consisting of a cylinder constructed of a series of discs similar to circular saws, but between each toothed one a plain disc of about the same diameter is placed, and all fixed upon an axle, and all screwed close together. Parallel to this roller

a plain roller is opposed, but which is made to revolve at a slower speed. A pair of feed rollers driven at the slower speed are placed in the same frame which feed the sole-leather, with the flesh side exposed to the action of the disc-roller, which rasps all the loose fibrous matter from the leather, and leaves a surface suitable for coating with the cement.

Leather and like material may be embossed for soles by passing such between rollers engraved or chased with the design. Ornamental dies, to be used either hot or cold for embossing, checquering, corrugating, indenting, or printing the soles as desired, are arranged to suit and adjust upon the ram bed in a machine, the ram of which is actuated by a revolving eccentric which embosses with rapidity. Reciprocating cutters and perforators for cutting out the soles or heels, and for perforating them according to my invention, are actuated by a revolving eccentric which accomplish the operation in the ordinary manner.

In preparing the soles or heels for inserting the studs I employ a series of taper half-round cutters fitted vertically, to revolve so as to cut out the required number of holes in their proper position through one or more thicknesses of leather at one operation, into which holes I insert studs. The studs, which are intended to render the soles more enduring, may be made by forming a thread or screw on a wire, which is afterwards cut off in suitable lengths for the purpose, or such studs may be cast of suitable metal. In moulding these screw studs I find it of advantage to proceed as follows: I cut the patterns from which the studs are to be cast in two halves longitudinally, and cement the halves on opposite sides of a plate of glass in position coinciding with each other.

I then impress the half-screw on one side of glass into the sand, on which the surface of glass presses, producing the division of the mould. The opposite half of pattern on the other side of glass is similarly impressed in the sand to form the opposite half of the mould.

The patterns and plates of glass being removed, the half-moulds are brought together for the purpose of casting in the ordinary manner. The moulding of such studs would of course be effected by placing a number of such patterns on one sheet of glass, and casting them in series. By using glass as the medium on which to affix the patterns the several half-patterns may readily be brought opposite

each other, and at the same time its transparency enables the moulder to see whether his moulds are perfect; clean castings will thus be obtained with facility.

These studs may also be made of stone, earthenware, or glass, coloured or otherwise, for the purposes of ornamentation. Ivory, bone, horn, nuts, wood, shells, hide, leather, hardened caoutchouc, or gutta percha are also suitable for studs when moulded, shaped or arranged for ornamental or wearing purposes.

In order to mould, emboss, or perforate soles and holes rapidly of gutta percha, gum muddar, or similar material in a plastic state, I employ two endless belts of articulated metal plates, which are each carried by a pair of drums or rollers, so placed and driven side by side that the faces of belts come together in juxtaposition, antagonistic to each other, and travelling in the same direction.

The belts are each furnished with suitable moulds, which meet and register properly with each other.

The belts and moulds where so meeting and travelling together pass through a tube or passage, bell-mouthed where they enter, but which is gradually contracted so as to bring the moulds in close and forcible contact; plastic material being fed between the belts and moulds, it is conveyed away in sufficient quantity, and carried through the contracting and compressing chamber, when it is moulded and consolidated into the form of the moulds. The moulds, on emerging from the compressing chamber, separate and deliver the moulded article suitably ornamented and embossed, if required. The latter portion of the compression chamber should be parallel, and surrounded with cold water, so as to harden the moulded articles before delivery, and while still under pressure. The compression chamber or passage may permit any superfluous material expressed from the mould to escape, it being simply necessary that the belts and moulds should be brought and kept in close proximity for the above purpose.

For rasping or cleaning the shoe soles preparatory to applying the adhesive soles, I form a brush or scraper, made by inserting sharp pointed steel pins into a metal head or wooden handle, similar to a brush.

For holding gutta percha or other soles while being heated for applying to the shoes, &c., I find it convenient to use a chamber or flat vessel with a raised flange or edge,

forming a recess in the side of the chamber in which the sole rests. This chamber is filled with cold water to keep that part of the sole cool which is not exposed to the fire or heat.

For heating the adhesive surface of soles I use a small chamber of burning charcoal presenting an open fire, or a series of burning jets of gas, or a camphine or naphtha lamp, may be used for the purpose.

The same means may also be used to dry the bottoms of boots or shoes preparatory to applying the adhesive soles. Small sharp screws, such as gun ramrod screws fixed in a handle, are useful to hold the sole on to the bottom of the boot or shoe, and prevent it shifting after being heated, and applied until the cement cools and sets.

Leather soles prepared according to this my invention of improvements will possess all the advantages of gutta percha soles, with greater durability in wear, facility of application, and without any disagreeable smell of naphtha or danger from fire, and at a much smaller cost.

Having thus described the nature of my invention, and the manner of carrying the same into effect, I desire it to be understood that I do not herein claim attaching gutta percha or leather soles or heels to boots or shoes with any solution, neither do I claim the use of cement for that purpose; but what I claim as secured to me is,—

First, I claim manufacturing soles and heels with a preparatory adhesive surface, as before described.

Secondly, I claim goloe soles fashioned so that the lower part of the boot or shoe may be fitted and encased, as described.

Thirdly, I claim perforating soles and heels formed of leather, gutta percha, or other materials that are of a close substance, in order to allow the air or superfluous cementing matter to escape through the perforations when attaching them to boots or shoes.

Fourthly, I claim the insertion of studs through one or more thicknesses of material, forming a sole or heel prior to application, as before described.

Fifthly, I claim the manufacture of soles with flexible vulcanized gutta percha or caoutchouc protruding in relief.

Sixthly, I claim an apparatus for holding and keeping cool gutta percha or adhesive soles while being heated.

Seventhly, I claim the instrument described for clearing

the bottoms of the boots or shoes preparatory to the application of adhesive soles.—In witness, &c.

JOHN WALLACE DUNCAN.

Specification of the Patent granted to HENRI JOSEPH SCOUTETTEN, *of Metz, in the Empire of France, and of No.* 16, *Castle-street, Holborn, City, London, for An Improved Plastic Compound, Applicable to various Ornamental and Useful Purposes.*—Dated May 21, 1853.

To all to whom these presents shall come, &c., &c.—This paste is composed of vegetable and mineral substances; the number and quantity of each varies according to the purpose for which the material is required. Thus, gutta percha, caoutchouc, pitch, resin, wax, gum lac, oxide of iron, golden sulphur of antimony, ultramarine, chrome, zinc white, &c.

Manufacture of the Paste.

A steam-engine serves to furnish steam to two superposed hollow cylinders. These cylinders are themselves moved by the steam, crush the substances which enter into the composition of the paste, and form a homogeneous mass. Double-bottom cauldrons, equally heated by steam, receive the matter, which, according to circumstances, may be heated dry or in hot water. When the paste is made it is put into moulds and compressed, in order to produce the objects required. These moulds are composed of gutta percha containing a twentieth part of caoutchouc; this process of moulding affords results hitherto unknown. Each mould should be bound with iron. This paste may also be composed chemically. In this case the gutta percha, caoutchouc, and pitch are dissolved in sulphuret of carbon. When the solution is complete and the combination well effected, the solution is purified, the sulphuret of carbon is drawn off, and a mass is obtained, which may be heated dry in close vessels. If it be desired to make pipes, boot soles, straps, &c., add to the above substances, held in solution in the sulphuret of carbon, carded cotton, all the portions of which are penetrated or exactly coated with the material. It is then purified, as in the former case, and a mass is obtained, which is heated dry and passed under

rollers. Under other circumstances, and accordi
known processes, the cotton is replaced by linen, c
silk, wool, or any other textile substance. The pas
prepared may be coloured by adding one or more
oxides indicated. When it is desired to render pa
stuffs impermeable, the caoutchouc and the gutta
must be separately dissolved in sulphuret of carbon,
proportion of eight of gutta percha for one hundred
phuret of carbon, well purified; the solution is left
during eight days, and the white of eggs is added
when the impure matters are deposited it is poure
to obtain an almost colourless liquid. Paper or stu
be then steeped in this liquid, and drawn from it by
them between cleaning rollers, which equalize the
the matter. These stuffs become fit for all imper
clothing. The paper rendered impermeable is suit
photography; it is a substitute for parchment; it
for the preservation of valuable papers, to prever
falsification, erasures, and the action of chemical
As to the applications of the paste, they are innum
they comprise a complete moulding material, eitl
objects of art or utility, and in many cases may
leather, pasteboard, plaster, carvings in wood, &c
objects may be bronzed, gilt, or silvered.—In witnes

HENRI JOSEPH SCOUTET

Specification of the Patent granted to JEAN DURA
junior, of Paris, in the Empire of France, and of
street, Holborn, City, London, General Manager
Firm Durandeau Junior and Chaveau, for Certain
of Obtaining Marks and Designs in Paper.—Dat
3, 1853.

To all to whom these presents shall come, &c.,
This invention consists in transferring marks in
during the process of satining; though these marks
transferred on zinc plates or other metal plates
satining by different means, I particularly insist
process consisting in engraving on a metallic plat
ciently hard, the mark or design wished to be obta
the paper. By passing this engraved plate with th

ing metallic sheets between the cylinders of a laminating machine, the pressure forces the metallic sheet to penetrate into the hollow of the engraving, making a relievo on this metallic sheet. It is easy to understand that by passing one after the other through the laminating machine all the satining metallic sheets with the engraved sheet, each will receive the same impression, and each sheet of paper satined by means of these plates will have in its thickness exactly the same design and at the same places. This small metallic relievo being solid, and taken in the thickness of the satining metallic plate, will be firm and lasting; thus the satining plates will be durable, and there will scarcely be any increase of expense. By this process the satining takes place according to the ordinary method; that is to say, by passing between smoothing cylinders packets of sheets of paper alternately with sheets of zinc bearing the designs in relief, and after this the reliefs become impressed in the sheets of paper.

I claim the means above described of obtaining upon paper manufactured mechanically and in a continuous manner marks, engravings, and designs, similar to those obtained by the aid of water-marks in paper made by hand, these designs being obtained during the operation of satining, as has been above described.—In witness, &c.

JEAN DURANDEAU.

Specification of the Patent granted to PETER ARMAND LE COMTE DE FONTAINE MOREAU, *of No.* 39, *Rue de l'Echiquier, Paris, France, and No.* 4, *South-street, Finsbury, London, for An Improved Process for Preserving Milk, and its Application to several Organic Products and Alimentary Substances.*—Dated June 16, 1853.—(A Communication.)

To all to whom these presents shall come, &c., &c.—The invention consists in an improved method of treating milk and other organic and alimentary substances for the purpose of preserving them. Organic substances are subject to modifications both from the action of atmospheric air and reaction of their own constituent elements.

These modifications not only change their peculiar pro-

perties, but often transform them into a variety of products far different to the bodies first constituting them. To preserve them it is necessary to protect them from the destructive influence of external atmospheric air, and to expel the air they may contain; and these objects are attained by forming a vacuum within the substances by an exhaust-pump, by raising their temperature, or by these two means combined.

To operate upon milk I exhaust the air it contains by using a tube which is filled with milk, and put in communication with a reservoir containing a convenient quantity of that liquid, and covered with a layer of oil to preserve its exposed surface from contact with the atmospheric air. When the operation is carried on with a larger number of vessels it is more convenient to place them one upon the other, and to put the layer of oil over the milk in the upper reservoir.

To effect the expulsion of air from the milk I adapt an air-exhausting-pump either to one reservoir or to two reservoirs. The connecting-pipes must be directly under the reservoirs containing the milk, and not have any bend, which might prevent the free egress of the air therefrom.

When operating on a small number of vessels it will be merely necessary to add to each of them a lead or tin pipe of sufficient length for containing a column of milk, through which the air can be expelled without causing the liquid to overflow, and in this case the layer of oil can be dispensed with. When the desired temperature is obtained either by a *balneum mariæ* or by steam, and when sufficiently sustained, I close the tube air-tight by means of pincers and solder, care being taken beforehand to have the vessel entirely full.

To avoid the danger of the vessels bursting when the preserved substances are to be exported to hot climates, the pipe must be closed when the contents are at the same degree of temperature as that of the climate whither they are to be taken.

The vessels I employ for preserving may be of tinned or enamelled iron, but when the nature of the substances allows of glass being employed, it is to be preferred.

Solid and soft alimentary substances must be introduced into a reservoir containing a certain quantity of liquid covered with a layer of oil, as before described, to prevent the contact of the air with the liquid.

Meat, for example, cooked in gravy, and fruits boiled in syrup, can be preserved by this process with great facility.

The aperture of the tube is sufficiently large to allow the introduction of liquid matters, but when the substances are of a solid or heavy nature, I introduce them into vessels composed of two parts, which must be afterwards joined together.

And having thus described the nature of the said invention communicated to me, and the manner of putting the same into execution, I wish it to be understood that I do not confine myself to the precise details herein laid down.

But what I claim as new, and intend to be protected by the said in part recited letters patent, is, the process of preserving milk and other organic alimentary substances, as hereinbefore described.—In witness, &c.

L. De Fontaine Moreau.

Specification of the Patent granted to Alfred Vincent Newton, *of Chancery-lane, in the County of Middlesex, Mechanical Draughtsman, for an Improved Mode of Manufacturing Cast-Steel.*—Dated June 14, 1853.—(A Communication.)

To all to whom these presents shall come, &c., &c.—This invention, as communicated to me by my foreign correspondent, relates to a mode of economising the fuel used in the manufacture of cast-steel. According to the present plan of working, the blistered steel to be converted into cast-steel after being broken up into small pieces is packed in crucibles, and subjected to the heat of a furnace maintained, as near as may be, during the whole of the operation at a melting heat; when, therefore, the steel is first introduced, a great waste of heat takes place, inasmuch as a considerably lower temperature than is used would suffice to raise the steel from a cold state to the proper degree of heat which it must attain before the "melting heat" is required to be applied.

In order to avoid the disadvantageous application of heat the inventor subjects the cold blistered steel to a preparatory heating before it is submitted to the action of the high or melting temperature. To attain this end he employs two furnaces of different heating capacities for bringing, by

their combined action, the blistered steel to a molten
The first of the two furnaces to which the steel is sub
may be of the kind known as a reverberatory furnace
a flat bed to carry the crucibles for containing the ste
the second furnace is preferred to be of the kind now
monly used in the manufacture of cast-steel, having "n
holes" suitable for receiving two or more crucibles
Melting furnaces are usually constructed with ten n
holes, of a capacity sufficient to receive two crucible
When using furnaces of this construction capable of
ing twenty crucibles at a time, an annealing oven
suitable capacity, is provided, as usual for heatin
crucibles prior to inserting them in the first or au
furnace. After they have attained in the annealing
sufficient heat, which is readily ascertained by the
operator, they are removed to the auxiliary furnace.
empty crucibles are subjected for about half an hour
heat of the furnace, after which time they will have a
a sufficient heat to receive the cold blistered steel w
cracking. The covers or doors of the auxiliary furn
now removed, and the crucibles are then charged w
blistered steel. When the charge is properly packed
crucibles their covers are put on, and then the co
doors of the furnace are replaced. The heating
continued for about two hours, the furnace being ke
welding heat, or to a degree of heat that will suf
agglutinate the steel, but will not reduce it to a dead
state. The second or melting furnace having in the
while been fired, and the temperature raised to the r
point, the crucibles are now removed from the an
furnace, and placed in the melting holes of the seco
nace, which holes are to be fed with coke in the usu
to keep up the temperature to the required degr
closed by a door or cover. The melting of the
(which has already attained in the auxiliary furnace
heat) now quickly commences, and after having bee
jected to the heat of the melting furnace for about on
and a half, the whole mass of agglutinated steel wi
become reduced to a fluid state, and may then be r
from the furnace and poured into suitable mould
carrying out this invention, many of the varieties of fi
now used in the manufacture of metals may be em
with advantage as an auxiliary furnace to effect the p
heating of the steel. Thus, for example, a rever

furnace, whether supplied with air by a fan blast or by a natural draught, and whether heated at one or both ends, may be used as an auxiliary furnace, the crucibles being placed on a flat bed, and the flame playing over and around them; or, if thought desirable, the waste heat from the melting furnace may be employed for giving the metal the preparatory heating.

Having now set forth the nature and object of this invention, "An improved mode of manufacturing Cast-Steel," and described the manner in which the same may be carried into effect, I wish it to be understood, that under the above in part recited letters patent I claim the reduction of blistered steel to a molten state by the process above explained, whether effected by the aid of two furnaces retained at different degrees of heat, or by other analogous means.—In witness, &c.

ALFRED VINCENT NEWTON.

Specification of the Patent granted to THOMAS RHODES, *of Regent Works, Leeds, in the County of York, for Improvements in the Manufacture of Manures.* — Dated March 12, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of reducing wool or hair into a finely-divided condition or pulp by machinery, such as is employed in paper-making, and then dissolving or treating the same by acid and alkali. The classes of wool to which the invention is more particularly applicable are the waste products of wool obtained in spinning, and also in shearing cloths and other processes of the woollen manufacture, and also wool obtained by reducing old fabrics of wool to pulp or fine division. And in order that my said invention may be most fully understood and readily carried into effect I will proceed to describe the means pursued by me. I take woollen rags, or shoddy, or old hair cloth, and reduce the same to pulp in a paper engine, and I strain off the excess of water, leaving in the water which does not readily drain away. I then mix with the pulp sulphuric acid, and afterwards combine this mixture with a quantity of ground bones, phosphorite, coprolite, burnt bones, or animal charcoal. Or the pulp, and bones, or other matters may

be first mixed together and then acted upon by sulph acid. For turnips I prefer the following mixture:—

For every 2 cwt. of the original shoddy or mater add about 4 cwt. of the sulphuric acid of commerce mix the same well together, and I then add about 12 of ground coprolite or mineral phosphate, ground b calcined bones, or animal charcoal; when these mat are thoroughly incorporated or mixed, and the efferves or action has somewhat subsided, the mass is moved the vat or vessel, in which the mixing has been perfo into a covered place, where by gradually drying it bec fit for use.

I would state that enough water is to be left in the to enable it to mix easily with the other materials, a that in mixing it may be a semi-fluid mass. Or in of such water, wine or gas-water containing the ammonia may be used, by which means the manure be rendered more valuable. If for corn crops I use or three times the quantity of shoddy pulp to the amount of the other ingredients.

Having thus described the nature of my said inve and the manner of performing the same, I would h understood that I make no claim to the use of cop or mineral phosphate, or bones, or animal charcoal sulphuric acid, in the manufacture of manure.

But what I claim is, reducing wool or hair into a f divided condition or pulp by machinery, and treatin applying the same in the manufacture of manure, as h explained.—In witness, &c.

THOMAS RHOD

Specification of the Patent granted to EDWARD HE *of Southwark, in the County of Surrey, Manufac Chemist, for Improvements in the Manufacture of Su of Quinine.*—Dated July 28, 1853.

To all to whom these presents shall come, &c., My said improvements relate to certain processes f complete extraction of quinine from Peruvian bark other suitable barks, in the form of sulphate of quinin without the aid of alcohol.

And for the better understanding of my said invention, I will now proceed to describe my processes in detail.

In my first process the bark in a powdered state is boiled in a solution of caustic soda, or other alkali, which removes the useless extractive and gummy colouring matter. After well boiling the bark, it is to be pressed and returned to a tub to be therein agitated with cold water, which operation is repeated until the colouring matter is exhausted. I next proceed to other boilings, as follows:—In the first boiling the decolorized bark, after the foregoing process, is boiled in sulphuric acid and water, in due proportions, and kept agitated by suitable mechanical means; and this hot solution of sulphate of quinine is then run off into an evaporating pan as customary. The remaining bark is now boiled a second time in weak sulphuric acid and water, and run off as before. The bark may be boiled a third time or oftener in sulphuric acid and water; but as each time the liquid will be less charged with the sulphates, these after-boilings may be reserved for each succeeding portion of fresh bark decolorized by the first or alkaline process. I would here observe, that in my first process I prefer using caustic soda, and that the first and second acid boilings are to be mixed and evaporated at a temperature of 120 degrees Fahrenheit, or thereabout, in a large water-bath, until sufficiently concentrated, and filtered when cool to separate the floculent colouring, which these deposit, and which may be treated with dilute sulphuric acid until exhausted. The filtered cold solution of the first and second or concentrated boilings before named, and also the washings of the floculent colouring, are to be neutralized by excess of caustic alkali; and the precipitated alkaloid drained, washed, and pressed. This last product is then treated with dilute sulphuric acid, a gentle heat applied, and the resulting impure sulphates of quinine, quinidin, and cinchonine, crystallized into a thick mass, which when cold is to be pressed, washed, and again pressed. The pressed cakes thus obtained are next to be dissolved in a large quantity of water, and crystallized as usual. These crystals will be sufficiently pure for chemical purposes, and afford the unbleached or hospital sulphate of quinine.

In the second, or bleaching process, the foregoing sulphate of quinine is subjected to one or two further crystallizations to produce the pure white article of commerce; and for this purpose the solutions are boiled with a due admixture of

pure animal charcoal, to avoid contamination with the salts of ordinary animal charcoal. The crystals obta are to be drained and dried at a low temperature, they will form the snow-white article of commerce, o bleached sulphate of quinine.

In my third process, the blood-red products of the boiled in the caustic soda solution, or other caustic alk substances, described in the first process, are to be tr with muriatic acid in excess, to retain the alkaloids in tion, which may have been dissolved by the first soc other alkaline boilings and washings. These being n are evaporated, and then filtered to separate a quanti colouring matter; the filtered solution is then to be pr tated by excess of lime, forming muriate of lime and mu of soda or other alkali in solution, while the alkaloids free lime are precipitated and may be washed, filt pressed, dried, and powdered. The calcareous precip is then ready to be treated by benzole or any solvent o alkaloids that is not a solvent of lime. These various tures or preparations are treated in the manner followin If by benzole, or turpentine, or lard, the tinctures or p rations are mixed with cold dilute sulphuric acid and w and well agitated, the benzole, turpentine, or lard fl while the water charged with the sulphuric acid sinks; acidulated water having now extracted the alkaloids the benzole, turpentine, or other tinctures or preparat the acid solution is syphoned off into a convenient ve and is precipitated by caustic soda; and the crude alka are obtained without the application of heat. And h the advantage of my improved process consists, rend such crystals less amorphous than they otherwise woul by the customary alcohol process, which does require If the calcareous precipitate has been treated by alc either naphtha or any spirit solvent, the tinctures are submitted to distillation, and the crude alkaloids wi thereby obtained, but is subject to the objection b named, of the requisite heat rendering the products amorphous. The crude alkaloids obtained by either pr are to be treated with dilute sulphuric acid by gentle and the impure sulphates crystallized into a mass. T crystals are then pressed, washed, and again pressed, are subjected to two or more crystallizations, in effectually to remove all traces of impurity, and the pre will then correspond in quality, though considerably le

quantity, to that obtained in the first product by my alkali process.

Having thus described the nature of my said invention, I would remark, that the sulphate of quinine obtained by the alkali process forms eighty to ninety per cent. of the required product, according to the quality of the bark; the remaining ten to twenty per cent. being recovered by my third process, before described. I would have it understood that my said processes may be variously modified, and yet in accordance with the principle of my said invention; and also that I do not claim the use of spirits of wine, or of carbonates of the alkalies, as ordinarily employed, but only when applied as in my third before-described process, wherein I prefer the alkalies, as in the first process being in a caustic state, and benzole or other suitable solvents employed without heat, as already directed. And I declare that what I claim as my invention is, namely, the peculiar processes of manufacturing the sulphate of quinine without the employment of alcohol, as described.—In witness, &c.

EDWARD HERRING.

Specification of the Patent granted to JOSEPH LEON TALABOT, *of Chaussée d'Antin, No.* 57, *Paris, Iron Master, and* JOHN DAVIE MORRIES STIRLING, *of the Larches, near Birmingham, in the County of Warwick, Esquire, for Improvements in the Manufacture of Cast Steel.*—Dated August 15, 1853.

To all to whom these presents shall come, &c., &c.—Our invention consists in modifying the character of steel by combining with blister steel when melting it, oxides of metals, or of the earthy bases, and thus producing cast steel of the character desired.

In manufacturing blister steel, various qualities are made, of which mild and highly converted steel are the two opposites, mild or low carburetted steel being produced by a shorter contact with charcoal in the converting furnace, highly converted steel, or that more highly charged with carbon, being produced by a longer exposure. By simply melting such classes of steel it is difficult repeatedly to get like qualities of cast steel. And it is the object of our invention to modify the quality of blister steel when melt-

ing it to produce cast steel, and this we do by adding thereto an oxide of a metal or of an earthy base, or oxides of metals or earthy bases, and on the quantity of such oxide added when acting on like qualities of blister steel will depend the quality of cast steel produced. Mild steel is much less fusible than highly converted steel, and it is sometimes advantageous to lower or bring back highly converted steel to the condition of mild steel by melting it, and this we do by the addition of various oxides, of which those of iron and of calcium are suitable. By varying the quantity of such oxides we produce certain and distinct qualities of cast steel from the same blister steel. If blister steel of highly carburetted quality be melted with a small quantity of an oxide of iron, (magnetic ore is preferred for this purpose, though other oxide may be used,) the cast steel will be very different from what would result from simply melting the highly carburetted blister steel alone, and it will be found that in proportion to the quantity of oxide of iron, so will be the character of cast steel thus manufactured; hence by such means a manufacturer may with facility and certainty command the quality of cast steel which he desires to produce.

The quantity of oxide of iron employed by us is from one to three, or four per cent., but we do not confine ourselves thereto. Oxide of calcium and lime has a similar effect to the oxides of iron in reducing the hardness of cast steel, and we employ it in the proportion of from 1-200th to 1-50th part of the weight of the steel. In using oxide of tin in combination with blister steel we find it better to apply the same in combination with mild blister steel or steel moderately carburetted, because it has the effect of hardening the cast steel produced, and the addition of a two-thousandth to one-thousandth part (2,000th to 1,000th part) of oxide of tin produces a very marked effect, similar to that which would result from carrying on the ordinary converting process for a longer period, hence the manufacturer will by proportioning the quantity of oxide of tin employed, be able to harden mild steel to the degree desired without carrying on the carburetting process to so high degree, and at the same time cast steel of different degrees of hardness may be obtained from the same quality of blister steel, by melting different quantities of the blister steel with different proportions of the oxide of tin.

Oxide of zinc has a toughening effect, and we use it, we believe, to the greatest advantage when employing it at the rate of from one four-hundredth to one two-hundredth part (1-400th to 1-200th part) of the weight of the steel employed.

We also use oxides or carbonates of the oxides of barium and other earthy bases, and we add these according to the quality of the steel, in very small proportions, or in the proportions of from a four-hundredth to a hundredth part (4-100th to 1-100th part).

In thus employing oxides of metals or oxides of the earthy bases, or combinations of these, we believe the best means of doing so is to introduce the quantity of the oxide to be used into the crucible or other apparatus, either at the same time with the blister steel or when the metal is in a pasty state.

We would remark that we are aware that oxide of manganese has before been used and is commonly used in the manufacture of cast steel, and we continue to use such matter as heretofore in conjunction with the other oxides.

We would, in conclusion, state, that, although we have been particular in giving the precise quantities of the oxides used by us, we do not in any of the cases confine ourselves thereto.— In witness, &c.

JOSEPH LEON TALABOT.
JOHN DAVIE MORRIES STIRLING.

Specification of the Patent granted to ISAAC LOWTHIAN BELL, *of the Washington Chemical Works, Newcastle-on-Tyne, for Improvements in the Manufacture of Sulphuric Acid.*—Dated September 9, 1853.

To all to whom these presents shall come, &c., &c.— That whereas Her Majesty's royal letters patent were granted to me on the 17th day of November, 1852, for Improvements in the treatment of certain compounds of Iron and Sulphur, which invention consists in fusing together a substance called "tank residuum" or "soda-makers' waste," and oxide of iron in a blast furnace, so as to obtain a compound of sulphur and iron which I have called factitious pyrites. When the furnace used for this purpose is tapped from time to time, this factitious

pyrites runs out of the bottom in the same way as
tised in the smelting of iron.

In applying this compound of sulphur and iro
factitious pyrites to the manufacture of sulphuric
I have experienced some difficulty in sufficiently bu
off the sulphur. Now, my present invention consis
treating this factitious pyrites so as to secure that its
phur shall be entirely or almost entirely burnt into
phureous acid, when the same is subjected to combu
and I proceed as follows:—

When the factitious pyrites runs out of the furna
which it is made, as detailed, I suffer it to flow into
taking care to have the water in such quantity th
temperature is always below the boiling point. In
tice I find that about one thousand cubic feet of wat
ordinary temperatures is sufficient for the treatment of
tons of melted factitious pyrites. By this operatio
factitious pyrites is obtained in the condition of a fine
or slime. This I remove from the tank or vessel
which it has been run, and spread in its pasty state
one and a-half inch thick, on a heated floor or d
bed, such as is used by brickmakers for drying b
before placing them in the kilns. The only precauti
this stage of the operation to be observed is, the tem
ture of the drying floor, which is best kept at a little
212 degrees, otherwise the factitious pyrites is ver
from its extreme combustibility in its present form to
fire. In from twelve to twenty-four hours the ca
spread is perfectly dry and ready for the kilns, in wh
has to be placed for the purpose of burning its su
into sulphureous acid. These kilns may be of the
nary construction employed by sulphuric acid makers
using the native pyrites for the production of sulphu
acid, or they may be varied. I find that the combusti
the factitious pyrites, prepared in the manner just
scribed, is more satisfactorily conducted when a kiln
ten feet square and six or eight feet high is empl
arched over at the top, and very similar in form an
to the kilns used in the burning of lime intended
made into bleaching powder. This kiln is connected
the oil of vitriol chambers, by means of a flue or flu
which are provided proper dampers or valves, so tha
communication with the vitriol chambers can be susp
at pleasure. In such a kiln I pile twenty-five or thirty

of the dry cake of factitious pyrites, broken into pieces about six inches square, and then apply a small quantity of fire, when the mass speedily commences to burn, its combustion being regulated by a cautious admission of air, otherwise the heat becomes so intense as to fuse the factitious pyrites under treatment, which would interfere materially with the combustion of the sulphur, as well as render the subsequent withdrawal of the charge, an operation of considerable difficulty. In from fourteen to twenty days combustion ceases, when the communication between the kiln and the vitriol chambers is cut off, the exhausted charge removed, and a fresh one introduced. The number of such kilns will vary with the extent of the manufactory, but they ought always to be sufficiently numerous when charged in succession to secure a pretty uniform flow of sulphureous acid into the chambers. The nitrous vapours are introduced in the usual way practised by makers of sulphuric acid.

Although I prefer following the mode of treating the factitious pyrites in the way just described, yet I do not confine myself to it, because the same results, or nearly the same, are obtained when the cooled factitious pyrites has water thrown over it, or is exposed to a humid atmosphere. The metallic mass crumbles down, and the powder produced thereby may be mixed with water to the consistency of a paste, which paste may be exposed on the drying floor to form the cakes ready for the kilns, as described of the factitious pyrites when run into water.

Now, I claim as my invention, the manufacture of sulphuric acid from factitious pyrites by making the same into a paste, as described, drying this paste so as to form thin cakes, and afterwards burning these cakes in suitable kilns. —In witness, &c.

ISAAC LOWTHIAN BELL.

Specification of the Patent granted to CHARLES GOODYEAR, *of Avenue-road, St. John's Wood, in the County of Middlesex, for Improvements in the Manufacture of Waterproof Fabrics.*—Dated August 30, 1853.

To all to whom these presents shall come, &c., &c.—This invention relates to waterproof fabrics, made of fibres,

and cemented together by means of india-rubber ce
Heretofore, in making such fabrics, it has been usu
employ india-rubber, dissolved in a suitable solvent, wi
other matters being mixed therewith. Now the pr
invention consists of mixing like fibres to those of whic
fabric is composed with the dissolved india-rubber, and
to use it in like manner to that in which the simple so
of india-rubber has been used, by which means the
mixed with the cement and the fibres of the fabri
interlock and combine, and produce more advanta
results than when simple cement is used.

Having thus stated the nature of my said inventi
will proceed to describe the manner of performing the

In place of using india-rubber cement in the or
state, I mix with it a quantity of fibres, such as the f
which are to be cemented together are made of, or of
stronger fibres; and it is desirable that there should
much fibre mixed with the india-rubber cement a
cement will take, and yet be sufficiently fluid to s
freely on the surfaces of the fabrics which are
cemented together. And it will be found that this m
cementing fabrics together is peculiarly applicable t
cementing of fabrics made of fleeces of fibres combine
a fabric by india-rubber cement. In other respect
cement is to be used as heretofore, and the maki
waterproof fabrics therewith is to be performed as h
fore, as is well understood.

Having thus described the nature of my inventio
the manner of performing the same, I would have it u
stood that what I claim is, the combining fibres with
rubber cement, used in cementing fabrics together,
manufacturing waterproof fabrics.—In witness, &c.

CHARLES GOODYE

Specification of the Patent granted to ROBERT TRO
of the Chamber of Commerce, Liverpool, for Improv
in Ventilating and Preventing Spontaneous Combust
Ships and other Vessels laden with Coal, Culm, or G
—Dated September 10, 1853.

To all to whom these presents shall come, &c.,
It has heretofore been usual in ships carrying coals t
a series of upright chimneys of wood, which, desc

through the cargo of coals, ascended through the deck; and a patent was granted, in 1848, to Mr. Meacock, for an invention, which consisted of employing systems of perforated tubes, under and covered by the cargo of coals, culm, or cinders, communicating with chimneys, rising through the cargo and through the deck. This invention consists of improvements for accomplishing like objects, and consists of applying numerous vertical or upright tubes of iron or other suitable material, extensively perforated with holes. In loading a ship or vessel, these tubes are placed or fixed upright in, and rise up above, the coal, culm, or cinders, in such manner that any gas or vapour evolved from the same may rise up such tubes, and be removed by means of any suitable exhausting apparatus, which, preventing accumulation of inflammable matters, will prevent spontaneous combustion.

In carrying out my invention, I place at intervals, from the bottom of the ship upwards, so that their upper ends come just above the top of the coal, culm, or cinders, and below the under side of the deck, a number of tubes, which I prefer to be of wrought-iron, such tubes being perforated with numerous small holes on all sides, and from end to end. The tubes I use are about five inches diameter, but this may be varied. I find that these tubes, when placed upright at about ten feet apart throughout the whole cargo, act very completely in passing off the gases and products from the coals, culm, or cinders, constituting a cargo, and I therefore prefer that they should be placed at that distance apart. When the ships have a platform above the keelson, I prefer that some of the tubes should pass through such platform, in order to create additional draught to carry off the gases, that that part of the ship should be well ventilated, and that no gas should remain there. By thus using numerous upright perforated tubes in the midst of the cargo, and rising up above the coals, culm, or cinders, the gases will rise up to the unfilled space below the deck, and I conduct the same away by means of tubes, of about five inches diameter, rising two or three feet above the hatchways, one such tube being used to each hatchway, with or without a cowl at the top; or, if desired, there may be a fan or other exhausting apparatus employed to withdraw the gas. And it is the use of numerous perforated tubes, arranged or fixed upright in the cargo, conducting the gases to the space above the cargo and below the deck, and con-

veying the gases away from such space, that constitute peculiarity of my invention.—In witness, &c.

ROBERT TRONS

Specification of the Patent granted to FRANCESCO CAPEC *of* 16, *Castle-street, Holborn, City, London, for C Improvements in the Manufacture of Candles.*—] May 6, 1853.

To all to whom these presents shall come, &c., In the melted tallow (but not while boiling) I put thousandth parts of acetate of lead, and then stir u mixture to facilitate the incorporation of the salt wi tallow. After some minutes I lessen the heat, but it still be sufficient to keep the tallow in a liquid state; which, fifteen thousandth parts of pulverized incense be thrown into the mixture, and one thousandth of of turpentine. I preserve the same degree of tempe till the salt be completely dissolved, and the ins portions of the incense precipitated, which genera accomplished in a couple of hours.

The acetate of lead gives to the tallow a degree of ness superior to that of ordinary tallow; the incens its soluble part contributes also its increase in hardnes gives it a sweet smell. The turpentine modifyin perfume of the incense makes it very similar to that o The incense and spirits of turpentine give a great bril to the flame.

This process affords the following advantages:—

First, the candles do not gutter;

Secondly, they have not the disagreeable sm tallow;

Thirdly, they are harder than those of ordinary tall

Fourthly, they are more lasting than ordinary candles; in fact, they last as long as stearine candles.

The substances above mentioned, as being used process, may be employed in varied quantities, accord the hardness or smell wished to be attained. I sou substitute for the acetate of lead oxydes or metallic called astringent or drying salts, which always imp considerable hardness.

Rosins or resinous gums may also be used inst

incense; however, I deem the first-mentioned substances (acetate of lead and incense) preferable. It is true that resinous or gummo-resinous substances have been before employed in the manufacture of candles, but they were previously prepared; they have not been employed and combined in their natural state with tallow for making candles. For economy, litharge may be substituted for acetate of lead in the proportion of sixteen thousandth's to a thousand parts of tallow. However, when the tallow is thoroughly melted I add eight thousandth's of acetate of lead, dissolved in hot water, taking care to pour but a small quantity at a time in the tallow. The mass of tallow should be stirred with a wooden agitator, so as to combine it well with the litharge.

I will here observe, that I do not limit myself to the exact quantities here indicated, though I claim them as being preferable to other proportions. Ordinary wicks may be used, or the same as those employed for stearine candles.

I claim the application of the substances herein mentioned, and in the manner herein described, to the manufacture of candles.—In witness, &c.

FRANCESCO CAPECCIONI.

Specification of the Patent granted to SAMUEL SCHOFIELD, *of Oldham, in the County of Lancaster, Cotton Spinner, for Certain Improvements in Machinery or Apparatus for Preparing and Spinning Cotton and other Fibrous Materials.*—Dated June 18, 1853.

To all to whom these presents shall come, &c., &c.—My improvements relate to all descriptions of machinery used or employed in the various branches or operations of preparing and spinning cotton and other fibrous materials wherein "drawing rollers" are employed. My invention applies to what are termed the "clearers," which are the small rollers or bosses covered with felt or cloth, and are usually placed above the first and second top "drawing rollers," resting or lying upon or between them, and revolving by friction arising from their contact with them, which bosses or "clearers" in the course of their revolutions clear the "drawing rollers" from the loose fibres or "fly," as it is termed. But, in consequence of the first and second

"drawing rollers" revolving at different speeds, a
"clearer" being immediately in contact with both of
the second "drawing roller" takes up again or dis
portion of the "fly" from off the "clearer," and t
reducing to a certain extent the advantages of the
and they allowing the "fly" to fall on to and nec
damage the roving or yarn, causing frequent "la
and breaking of the said roving or yarn in all such
nery as hitherto employed. My invention cons
placing the "clearer" or clearers above the centre
axis of the first "drawing roller," and in contact w
first top or front "drawing roller" alone, whereby it
all the loose fibres or "fly" which it takes up, and t
aforesaid "lapping" and breaking of the roving or
in a great measure obviated, and rendered very mu
frequent of occurrence. It will, of course, be evident
competent mechanic that the ends or axis of th
"clearers" or bosses may revolve in suitable carr
bearings in slots or guides in order to maintain t
their proper position; and I would recommend t
some instances they may be caused to traverse
along the top of the drawing roller, and also t
some instances they may be made slightly conica
end to end.

Having now fully described the nature of my said
tion, and the manner in which the same is to be perf
I desire it to be understood that I claim as my in
the application, employment, or use of the well-
bosses or rollers called "clearers," constituting p
machinery or apparatus for preparing and spinning
and other fibrous materials, placed above the centre
axis of the "first drawing roller," and revolving in
with the first top or front "drawing roller" a
In witness, &c.

SAMUEL SCHOF

PATENTS SEALED TO MARCH 25, 1

2385. ANTOINE CORVI, Organ-builder, of Paris, for Impro
in stationary and portable organs with keys and cylinders.
October 19, 1853. Sealed February 22, 1854.

2420. ANDRE ALEXANDER BEAUMONT, of Paris, for A sy

production of caloric with or without combustible material.—Dated October 19, 1853. Sealed February 22, 1854.

2542. BENJAMIN BUTTERWORTH, of Calder Cottage, Caldershaw, near Rochdale, Lancaster, Grocer, for Improvements in combining oil with other liquids for the obtainment of a new lubricating compound. —Dated November 2, 1853. Sealed February 22, 1854.

2733. HUGH MASON, of Ashton-under-Lyne, Manufacturer, and JOHN JONES, of Manchester, Machine-maker, for Improvements in machinery or apparatus for doubling, twisting, and spooling woollen, cotton, and other yarns.—Dated November 24, 1853. Sealed February 22, 1854.

2782. JOHN ELCE, of Manchester, Machine-maker, for Certain improvements in machinery for spinning.—Dated November 30, 1853. Sealed February 22, 1854.

2840. WILLIAM SLATER and ROBERT HALLIWELL, both of Bolton-le-Moors, Lancaster, Foremen, for Improvements in machinery for spinning.—Dated December 7, 1853. Sealed February 22, 1854.

2878. CHARLES COATES, of Sunnyside, near Rawtenstall, Lancaster, Mechanic, for Improvements in and applicable to looms for weaving. —Dated December 10, 1853. Sealed February 22, 1854.

2919. WILLIAM BINNION, of Birmingham, Manufacturer, for Improvements in carriage and other lamps.—Dated December 16, 1853. Sealed February 22, 1854.

2921. WILLIAM TRANTER, of Birmingham, Gun-maker, for Certain improvements in fire-arms, and in bullets and waddings to be used therewith.—Dated December 16, 1853. Sealed February 22, 1854.

2963. JAMES BURROWS, of Haigh Foundry, near Wigan, Lancaster, Engineer, for Certain improvements in the construction of steam-boilers or generators, and in the arrangement of furnaces connected therewith.—Dated December 20, 1853. Sealed February 22, 1854.

3004. JAMES TAYLOR, of Britannia Works, Birkenhead, Chester, for Certain improvements in raising and lowering weights.—Dated December 28, 1853. Sealed February 22, 1854.

3016. MARY PHILLIPS, of Birmingham, Widow, for An improvement or improvements in metallic revolving or winding shutters.— —Dated December 29, 1853. Sealed February 22, 1854.—(A communication.)

3017. AMEDEE FRANÇOIS REMOND, of Birmingham, Gentleman, for New or improved metallic tubes.—Dated December 29, 1853. Sealed February 22, 1854.

1971. GEORGE POLLARD, of Watling-street, London, Envelope Manufacturer, and GEORGE MUMBY, of Hunter-street, Brunswick-square, Middlesex, Mechanical Draughtsman, for Improvements in machinery or apparatus for the manufacture of envelopes.—Dated August 24, 1853. Sealed February 24, 1854.

1972. ALFRED AUGUSTUS DE REGINALD HELY, of Cannon-row, Westminster, Middlesex, Civil Engineer, for Certain improvements applicable to shades or chimneys for lamps, gas, and other burners.— Dated August 24, 1853. Sealed February 24, 1854.

1973. ALFRED SWONNELL, of Kingston-on-Thames, Surrey, Gentleman, for An improved construction of tie for neck-cloths and neck-ribbons, applicable also to neck-ribbons of caps and bonnets.—Dated August 24, 1853. Sealed February 24, 1854.

1979. GEORGE DAVIS, of the City of London, for Certain apparatus

for distinguishing genuine from counterfeit coin.—Dated August 25, 1853. Sealed February 24, 1854.

1981. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in the treatment of wool and silk, and in machinery for preparing silk so treated.—Dated August 26, 1853. Sealed February 24, 1854.—(A communication.)

2230. HENRY JEREMIAH ILIFFE and JAMES NEWMAN, of Birmingham, Manufacturers, and HENRY JENKINS, of the same place, Die Sinker, for Improvements in the manufacture of buttons.—Dated September 29, 1853. Sealed February 24, 1854.

2462. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for An improved construction of a railroad carriage axle.—Dated October 25, 1853. Sealed February 24, 1854. —(A communication.)

2518. RICHARD RESTELL, of Croydon, Surrey, Watch and Clock Maker, for Improvements in warming conservatories, greenhouses, and other buildings.—Dated October 31, 1853. Sealed February 24, 1854.

2884. WILLIAM THORNLEY, of Clayton West, York, Manager, for An improved manufacture of woven fabrics.—Dated December 10, 1853. Sealed February 24, 1854.

3036. RICHARD WAYGOOD, of Newington Causeway, Surrey, Ironfounder, for Improvements in portable forges.—Dated December 31, 1853. Sealed February 24, 1854.

1987. WILLIAM HARGREAVES, of Bradford, York, Machine Wool Comber, for Improvements in machinery for preparing and combing wool, hair, flax, silk, and other fibrous surfaces.—Dated August 27, 1853. Sealed February 27, 1854.

2043. JOHN SMALLEY, of Bishopgate, Wigan, Lancaster, Accountant, and WASHINGTON SMIRKE, of Ince, in the parish and county aforesaid, Smith, for An improvement in railway carriage axles.—Dated September 5, 1853. Sealed February 27, 1854.

2071. PETER ARMAND LECOMTE DE FONTAINE MOREAU, of South-street, Finsbury, in the county of Middlesex, for Certain improvements in lighting, for consuming the carbon escaping combustion in ordinary flames.—Dated September 9, 1853. Sealed February 27, 1854.—(A communication.)

2139. WILLIAM NASH, of Burslem, Stafford, Whitesmith, for An improved mode of manufacturing china and earthenware articles on the lathe.—Dated September 14, 1853. Sealed February 27, 1854.

2197. JAMES LEETCH, of Birmingham, Gun Maker, for An improved method of constructing breech-loading fire-arms.—Dated September 23, 1853. Sealed February 27, 1854.

2241. CALEB BLOOMER, of Golds-hill, West Bromwich, Stafford, Manufacturer, for Improvements in the manufacture of anchors.—Dated October 1, 1853. Sealed February 27, 1854.

2285. MANUEL FERNANDEZ DE CASTRO, of Madrid, Mining Engineer, for Improved means of preventing accidents on railways.—Dated October 6, 1853. Sealed February 27, 1854.

2535. FREDERICK ALBERT GATTY, of Accrington, Lancaster, Manufacturing Chemist, for An improved bath for heating and distilling. —Dated November 7, 1853. Sealed February 27, 1854.

2719. BENJAMIN BURLEIGH, of the Great Northern Railway, King's Cross, Middlesex, for Improved railway crossings as adapted to

the double-headed rail and the ordinary rail and chair.—Dated November 22, 1853. Sealed February 27, 1854.

2758. GEORGES EDOUARD GAZAGNAIRE, of Marseilles, for Improvements in the manufacture of nets for fishing and other purposes. —Dated November 26, 1853. Sealed February 27, 1854.

2763. THOMAS CHAMBERS and JOHN CHAMBERS, of the Thorncliffe Iron Works, near Sheffield, for Certain improvements in kitchen sinks.—Dated November 26, 1853. Sealed February 27, 1854.

2947. HENRY MILWARD, of Redditch, Worcester, Manufacturer, for New or improved machinery for manufacturing needles and fish hooks.—Dated December 29, 1853. Sealed February 27, 1854.—(A communication.)

2949. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, London, for Improvements in paddle-wheels for propelling vessels.—Dated December 19, 1853. Sealed February 27, 1854.—(A communication.)

2969. THOMAS VINCENT LEE, of Lockyer-terrace, Plymouth, Civil Engineer, for Improvements in the construction of certain machinery and apparatus for the manufacture of bricks and tiles.—Dated December 21, 1853. Sealed February 27, 1854.

2997. FREDERICK CRACE CALVERT, of Manchester, Professor of Chemistry, for Improvements in the treatment of naphthas and other volatile hydrocarbons, and in the application of the same to various useful purposes.—Dated December 27, 1853. Sealed February 27, 1854.—(A communication.)

3032. CHRETIEN GUILLAUME SCHONERR, of Chemnitz, in the kingdom of Saxony, Mechanical Engineer, for Improvements in bobbin machines.—Dated December 31, 1853. Sealed February 27, 1854.

2000. JOSEPH CUNDY, of Victoria-road, Kensington, Middlesex, for Improvements in kitchen ranges and cooking apparatus.—Dated August 29, 1853. Sealed February 28, 1854.

2004. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Middlesex, Gentleman, for Improvements in the preparation and application of gluten.—Dated August 29, 1853. Sealed February 28, 1854.—(A communication.)

2010. JOSEPH CUNDY, of Victoria-road, Kensington, Middlesex, for Improvements in gas-stoves.—Dated August 30, 1853. Sealed February 28, 1854.

2015. EZRA WASHINGTON BURROWS, of Pentonville, Middlesex, Civil Engineer, for Improvements in the construction of cranes and other machines for raising heavy bodies.—Dated August 31, 1853. Sealed February 28, 1854.

2019. EDWARD SMITH, of the Patent Woollen Cloth Company, Love-lane, London, Gentleman, for An improved mode of manufacturing carpets.—Dated August 31, 1853. Sealed February 28, 1854.

2022. WILLIAM BECKETT JOHNSON, of Manchester, Manager, for Improvements in steam-engines and in apparatus connected therewith.—Dated August 31, 1853. Sealed February 28, 1854.

2151. HENRY MEYER, of Manchester, Engineer, for Improvements in looms for weaving.—Dated September 16, 1853. Sealed March 1, 1854.

2286. ALFRED ELY HARGROVE, of the city of York, Printer, and RALPH RICHARDSON, of Hartlepool, Durham, Engineer, for Improve-

ments in machinery or apparatus for printing.—Dated October 6, 1853. Sealed March 1, 1854.

2500. JAMES NASMYTH, of Patricroft, Lancaster, Engineer, for Improvements in the pistons and piston-rods of steam-hammers and pile-drivers, and in the parts in immediate connexion therewith.—Dated October 29, 1853. Sealed March 1, 1854.

2710. WILLIAM MEE, of Leicester, Manufacturer, for Improvements in the manufacture of braces.—Dated November 22, 1853. Sealed March 1, 1854.

3012. DUNCAN M'NEE, of Hillfield, Kirkintillock, Dumbarton, Printer, and ALEXANDER BROADFOOT, Merchant, of 128, Ingram-street, Glasgow, for Improvements in printing with colours on cloth, which are also applicable to printing ornamental designs on paper or other surfaces.—Dated December 28, 1853. Sealed March 1, 1854.

54. ANTOINE MARIE EDOUARD BOYER ELIE DUCROS and OSSIAN VERDEAU, of Paris, for Certain improved compounds to be used in dyeing.—Dated January 10, 1854. Sealed March 1, 1854.

56. The Rev. WILLIAM RENWICK BOWDITCH, of Wakefield, York, Clerk, Bachelor of Arts, for Improvements in the purification of gas, and in the application of the materials employed therein.—Dated January 10, 1854. Sealed March 1, 1854.

2031. JAMES PIGOTT PRITCHETT, the younger, of York, Architect, for Improvements in window-sashes and shutters.—Dated September 2, 1853. Sealed March 2, 1854.

2177. HENRY WALKER, of Gresham-street, London, Manufacturer, for Improvements in the modes or means of stopping or retarding vehicles used on railways.—Dated September 20, 1853. Sealed March 3, 1854.

2512. PERCEVAL MOSES PARSONS, of Duke-street, Adelphi, Middlesex, Civil Engineer, for Certain improvements in the switches and crossings of railways.—Dated September 20, 1853. Sealed March 3, 1854.

2671. ROBERT GRIFFITHS, of the Strand, for Improvements in propelling vessels.—Dated November 17, 1853. Sealed March 3, 1854.

2961. JOHN WEBSTER, of Cornwall-road, Stamford-street, for Improvements in acting on drying oils and preparing varnishes.—Dated December 20, 1853. Sealed March 3, 1854.

1. CHARLES HUSTINGS COLLETTE, of Lincoln's-inn-fields, Middlesex, Gentleman, for Improvements in the manufacture of sugar.—Dated January 2, 1854. Sealed March 3, 1854.

1299. JOHN BOX, of Rue Pepinière, Brussels, Furnishing Engineer, for Improvements in supplying water to steam-engine boilers.—Dated May 26, 1853. Sealed March 3, 1854.

2048. LEMUEL WELLMAN WRIGHT, of Chalford, Gloucester, for Improvements in reaping and gathering machines. — Dated September 6, 1853. Sealed March 6, 1854.

2051. HENRY WILKINSON, of the Brass Foundry, Tottenham-mews, for Improvements in the construction of air-furnaces, parts of which improvements are applicable to other furnaces.—Dated September 6, 1853. Sealed March 6, 1854.

2053. THOMAS POPE and EDWARD BUFTON, both of Birmingham, for Improvements in buttons, and which improved buttons they propose to designate by the name of "Buffalo buttons."—Dated September 6, 1853. Sealed March 6, 1854.

2054. ALFRED SOMERVILLE and CHARLES TWIGG, both of Birmingham, for Improvements in pen-holders, and which said improvements are applicable to the manufacture of umbrella and parasol-sticks, cornice-poles, and other such-like articles.—Dated September 6, 1853. Sealed March 6, 1854.

2055. ISAAC SMITH, of Birmingham, Machinist, and ALFRED SOMMERVILLE, of Birmingham aforesaid, Merchant, for Improvements in metallic pens and pen-holders.—Dated September 7, 1853. Sealed March 6, 1854.

2056. JOSEPH ALSOP, of Huddersfield, Baker, and EDWARD FAIRBURN, of Kirkler's Mills, Mirfield, York, for Improvements in baking bread.—Dated September 7, 1853. Sealed March 6, 1854.

2058. DAVID LAW, of Glasgow, and JOHN INGLIS, of the same place, Ironfounders, for Improvements in moulding or shaping metals. —Dated September 7, 1853. Sealed March 6, 1854.

2062. BENJAMIN HUSTWAYTE, of Hockley-street, Homerton, Middlesex, Bricklayer, and RICHARD JOHN PAUL GIBSON, of Upper Brunswick-street, Hackney, in the same county, Builder, for An improved composition or compositions applicable to the manufacture of bricks, tiles, and other moulded articles.—Dated September 7, 1853. Sealed March 6, 1854.

2072. JONAS RADFORD, of Cheltenham, for Improvements in clocks or time-keepers.—Dated September 9, 1853. Sealed March 6, 1854.

2116. HENRY DUBS, of Vulcan Foundry, near Warrington, Lancaster, Engineer, for Improvements in the method of forging or manufacturing iron and steel.—Dated September 13, 1853. Sealed March 6, 1854.

2306. HENRY DUBS, of Vulcan Foundry, near Warrington, Lancaster, Engineer, for Certain improvements in the manufacture of wheels and tires, and also in the construction of furnaces employed in such or similar manufactures.—Dated October 8, 1853. Sealed March 6, 1854.

2616. HENRY KILSHAW, of Birch, near Middleton, Lancaster, Manager, and RICHARD HACKING, of Bury, in the same county, Machinist, for Certain improvements in machinery or apparatus for spinning cotton and other fibrous substances.—Dated November 11, 1853. Sealed March 6, 1854.

2624. HENRY KILSHAW, of Birch, near Middleton, Lancaster, Manager, and RICHARD HACKING, of Bury, in the same county, Machinist, for Improvements in machinery or apparatus to be employed in the preparation of cotton and other fibrous substances for spinning.—Dated November 12, 1853. Sealed March 6, 1854.

3041. ADOLPHUS OPPENHEIMER, of Manchester, for Certain improvements in the manufacture of silk velvet and other such piled goods or fabrics.—Dated December 31, 1853. Sealed March 6, 1854.

2068. JAMES COATE, of Marylebone-street, Regent-street, Middlesex, Brush Manufacturer, for Improvements in tooth, nail and hair-brushes.—Dated September 8, 1853. Sealed March 8, 1854.

2080. CHARLES ASKEW, of Charles-street, Hampstead-road, Middlesex, for Improvements in baths.—Dated September 9, 1853. Sealed March 8, 1854.

2086. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for An improved manufacture of gas burner and gas regulator.—Dated September 9, 1853. Sealed March 8, 1854. —(A communication.)

2092. JOHN GRIST, of Islington, Middlesex, Engineer, for An improved stave jointing or shaping machine.—Dated September 10, 1853. Sealed March 8, 1854.

2103. WILLIAM WEILD, of Manchester, Engineer, for Improvements in lathes and in apparatus connected therewith for cutting, turning, or boring wood, metal, or other substances.—Dated September 12, 1853. Sealed March 8, 1854.

2104. JOHN WRIGHT CHILD, of Halifax, York, and ROBERT WILSON, of Low Moor Iron Works, in the same county, Engineer, for Improvements in valves and pistons.—Dated September 12, 1853. Sealed March 8, 1854.

2112. CHARLES CANNON, of Dance-street, Liverpool, Chair Maker, for Improved machinery for obtaining motive power.—Dated September 12, 1853. Sealed March 8, 1854.

2132. JAMES HIGGIN, of Manchester, Manufacturing Chemist, for Improvements in burning certain fluids for the purpose of obtaining heat.—Dated September 14, 1853. Sealed March 8, 1854.

2142. THOMAS BROWNING, of Pendleton, Lancaster, Machinist, for Improvements in machinery or apparatus for washing, scouring, or cleansing woven fabrics either with plain or pile surfaces.—Dated September 15, 1853. Sealed March 8, 1854.

2155. WILLIAM CARRON, of Birmingham, Machinist, for An improvement or improvements in signalling or communicating intelligence.—Dated September 16, 1853. Sealed March 8, 1854.

2182. WILLIAM STOCKIL, of Long-lane, Surrey, Currier, for A new or improved method of blocking leather used in the manufacture of boots.—Dated September 20, 1853. Sealed March 8, 1854.

2193. EDWARD OLDFIELD, of Salford, Lancaster, Machine Maker, for Certain improvements in machinery for spinning and doubling.—Dated September 22, 1853. Sealed March 8, 1854.

2196. SAMUEL ALEXANDER BENETFINK, of Cheapside, in the city of London, Ironmonger, for An improved construction of coal-box.—Dated September 22, 1853. Sealed March 8, 1854.

2222. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Middlesex, Gentleman, for Improvements in machinery or apparatus for cutting paper.—Dated September 28, 1853. Sealed March 8, 1854.

2253. MICHAEL DWYER, of Unity-place, Samuel-street, Woolwich, Commander in the Royal Navy, and JAMES BROWN, of Bridge-terrace, Mile-end, Middlesex, Machinist, for An improvement in anchors.—Dated October 3, 1853. Sealed March 8, 1854.

2436. PIERRE MARIE FOUGUE, Civil Engineer, LOUIS RENE HEBERT, and VINCENT ETIENNE DORET LE MARNEUR, of Paris, for A fortune rudder in bronze.—Dated October 21, 1853. Sealed March 8, 1854.

2803. HENRY DEACON, of Widnes, Lancaster, Manufacturing Chemist, and EDMOND LEYLAND, of St. Helen's, in the same county, Builder, for Improvements in apparatus for the manufacture or production of sulphuric acid.—Dated December 2, 1853. Sealed March 8, 1854.

2827. EDWARD LAVENDER, of Deptford, General Trader, for Improvements in apparatus for subjecting substances to the action of heat for the purpose of carbonizing, calcining, or combining such substances, or for subjecting such substances to the process of distillation.—Dated December 5, 1853. Sealed March 8, 1854.

2859. PIERRE MARIE FOUGUE, Civil Engineer, LOUIS RENE

HEBERT, and VINCENT ETIENNE DORET LE MARNEUR, of Paris, for Improvements in rudders.—Dated December 10, 1853. Sealed March 8, 1854.

7. PETER ARMAND LECOMTE DE FONTAINE MOREAU, of South-street, Finsbury, Middlesex, for Certain improvements in paddle-wheels.—Dated January 2, 1854. Sealed March 8, 1854.—(A communication.)

86. ROBERT MACLAREN, of Glasgow, Engineer, for Improvements in moulding or shaping metals.—Dated January 12, 1854. Sealed March 8, 1854.

110. ROBERT MACLAREN, of Glasgow, Engineer, for Improvements in moulding or shaping metals.—Dated January 18, 1854. Sealed March 8, 1854.

128. ALEXANDER DALGETY, of Florence-road, Deptford, Engineer, for A new construction of rotatory engines or pumps.—Dated January 19, 1854. Sealed March 8, 1854.

2089. ARTHUR WARNER, of Dorset-place, Dorset-square, London, for The application of the fibrous part of the palm-tree and leaf to arts and manufactures.—Dated September 10, 1853. Sealed March 10, 1854.

2107. JOHN LILLEY, of Jamaica-terrace, Limehouse, Middlesex, Nautical and Mathematical Instrument Maker, for Improvements in mariners' compasses.—Dated September 12, 1853. Sealed March 11, 1854.

2118. ALEXANDER ALLAN, of Crewe, Chester, Engineer, for Improvements in locomotive and other boilers for generating steam.—Dated September 13, 1853. Sealed March 11, 1854.

2127. PHILIP WEBLEY, of Birmingham, Manufacturer, for Improvements in repeating pistols and other fire-arms.—Dated September 14, 1853. Sealed March 11, 1854.

2144. THOMAS WILLIAM KEATES, of Chatham-place, Blackfriars, London, Chemist, for Improvements in the distillation of turpentine and other resinous substances, and their products.—Dated September 15, 1853. Sealed March 11, 1854.

2164. JONATHAN BURTON, of Crashaw-Booth, Lancaster, Manager, for Improvements in shuttles for weaving, the whole or part of which are applicable to skewers used in winding and reeling machines.—Dated September 17, 1853. Sealed March 11, 1854.

2169. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in the manufacture of soap and saponaceous compounds.—Dated September 17, 1853. Sealed March 11, 1854.—(A communication.)

2204. ALEXANDER DALGETY, of Florence-road, Deptford, for Improvements in lathes.—Dated September 24, 1853. Sealed March 11, 1854.

2220. LOUIS DOMINIQUE GIRARD, Civil Engineer, of Paris, for Improvements in hydraulic engines.—Dated September 28, 1853. Sealed March 11, 1854.

2221. JOHN BARSHAM, of Kingston-upon-Thames, Surrey, for Improvements in the manufacture of bricks, tiles, and blocks.—Dated September 28, 1853. Sealed March 11, 1854.

2240. JOHN TAYLOR, of Princes-square, Middlesex, Engineer, for An improvement in the treatment or preparation of skins.—Dated September 30, 1853. Sealed March 11, 1854.—(A communication.)

2252. WILLIAM BROWN, of Bradford, York, Mechanic, for Improve-

ments in apparatus used in washing wool and other fibrous material.—Dated October 1, 1853. Sealed March 11, 1854.

2283. JOSEPH HENRY CARY, of Norwich, Pianoforte-action Maker, for An improved pianoforte-action for upright pianofortes.—Dated October 6, 1853. Sealed March 11, 1854.

2933. CHARLES GOODYEAR, of St. John's-wood, Middlesex, for Improvements in the treatment and manufacture of india-rubber.—Dated December 16, 1853. Sealed March 11, 1854.—(Partly a communication.)

2948. JOHN TRIBELHORN, of St. Gall, Manufacturer, and Dr. POMPEJUS BOLLEY, of Aarau, Professor of Chemistry, both of Switzerland, for Improvements in the process of bleaching vegetable fibrous substances.—Dated December 19, 1853. Sealed March 11, 1854.—(A communication.)

2985. FRANCIS BENNOCH, of Wood-street, Cheapside, London, for Improvements in coating silk and other yarn or thread with gold or other metal.—Dated December 23, 1853. Sealed March 11, 1854.—(A communication.)

3014. HENRY JACKSON, of High-street, Poplar, Middlesex, for Improvements in machinery for moulding bricks and other articles of brick earth.—Dated December 29, 1853. Sealed March 11, 1854.

3033. JOHN PYM, of Pimlico, Middlesex, Gentleman, for Improvements in machinery for grinding auriferous and other ores, and separating the metal therefrom.—Dated December 31, 1853. Sealed March 11, 1854.

3035. ALFRED TRUEMAN, of Swansea, and ISHAM BAGGS, of London, for Improvements in grinding, amalgamating, and washing quartz, and other matters containing gold.—Dated December 31, 1853. Sealed March 11, 1854.

63. JOSEPH JOHN WILLIAM WATSON, of Old Kent-road, Surrey, Doctor of Philosophy, for Improvements in signalling.—Dated January 11, 1854. Sealed March 11, 1854.

162. JOHN LOCKHART, of Paisley, Renfrew, Wood Turner, for Improvements in the manufacture of bobbins.—Dated January 23, 1854. Sealed March 11, 1854.

168. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, London, for Improvements in machinery for bending metal and producing forms thereon by pressure.—Dated January 23, 1854. Sealed March 11, 1854.—(A communication.)

2119. JAMES HILL DICKSON, of Evelyn-street, Lower-road, Deptford, Kent, Flax Manufacturer and Flax Machinist, for Improvements in machinery or apparatus for the preparation of flax and similar fibrous material.—Dated September 13, 1853. Sealed March 13, 1854.

2128. JOHN TIMMIS, of Stafford, Surveyor, for Improvements in safety-valves for boilers.—Dated September 14, 1853. Sealed March 14, 1854.

2129. ALEXANDER WALLACE, of Glasgow, and GEORGE GALLOWAY, of the same place, Smiths, for Improvements in the construction of portable articles of furniture.—Dated September 14, 1853. Sealed March 14, 1854.

2141. ELIEZER EDWARDS, of Birmingham, Manufacturer, for A new or improved gas-stove.—Dated September 15, 1853. Sealed March 15, 1854.

2143. HENRY KRAUT, of Zurich, Engineer, for Improvements in

tools or implements to be used for boring or cutting rock or other hard substances for the purpose of blasting.—Dated September 17, 1853. Sealed March 15, 1854.

2147. HENRY JEANNERET, of Great Tichfield-street, Middlesex, M.D., for Improvements in machinery for digging and tilling land. —Dated September 15, 1853. Sealed March 15, 1854.

2152. DAVID MUSHET, of Coleford, Gloucester, Gentleman, for Improvements in steam-engine boiler and other furnaces.—Dated September 16, 1853. Sealed March 15, 1854.

2159. ALEXANDER THOMSON, of Glasgow, Brick Builder, and DAVID LOCKERBIE, of same place, Manager, for Improvements in kilns for baking and burning articles in earthenware.—Dated September 16, 1853. Sealed March 15, 1854.

2160. JOHN ADCOCK, of Marlborough-road, Dalston, Middlesex, Cigar Manufacturer, for An improved apparatus for measuring the distance travelled by vehicles.—Dated September 16, 1853. Sealed March 15, 1854.

2161. BALDWIN FULFORD WEATHERDON, of Chancery-lane, Middlesex, and MATTHEW SLADE HOOPER, of Sydenham, Kent, for Certain improvements in railway signals.—Dated September 16, 1853. Sealed March 15, 1854.

2166. CHRISTOPHER NICKELS, of York-road, Lambeth, and RALPH SELBY, of York-road aforesaid, for Improvements in the manufacture of flexible tubes and bands, and in covering wire.—Dated September 17, 1853. Sealed March 15, 1854.

2172. WILLIAM LANPHIER ANDERSON, of Norwood, Surrey, Gentleman, for Improvements in propelling ships and other vessels.— Dated September 19, 1853. Sealed March 15, 1854.

2270. JAMES LEE NORTON, of Ludgate-hill, London, Gentleman, for Improvements in instruments or apparatus for measuring and indicating the distance travelled by carriages, and in the means of transmitting motion thereto from the running wheels.—Dated October 4, 1853. Sealed March 15, 1854.

2783. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, London, for Certain improvements in the construction of the jacquard machine.—Dated November 30, 1853. Sealed March 15, 1854.—(A communication.)

97. WILLIAM CROSSKILL, of Beverley, York, Civil Engineer, for Improvements in construction of portable railways.—Dated January 16, 1854. Sealed March 15, 1854.

107. WILLIAM CROSSKILL, of Beverley, York, Civil Engineer, for An improvement in the construction of carriage wheels to run on railways and ordinary roads.—Dated January 17, 1854. Sealed March 15, 1854.

115. EDWARD LORD, of Todmorden, York, Machine Maker, for Certain improvements in looms for weaving.—Dated January 18, 1854. Sealed March 15, 1854.

181. JOHN BAPTY, of Leeds, Yarn Spinner, for Certain improvements in machinery for preparing to be spun wool and other fibrous substances when mixed with wool.—Dated January 24, 1854. Sealed March 15, 1854.

2168. BARON HENRY DE BODE, of Albert-street, Camden-road, Middlesex, for Improvements in the manufacture of wheels.—Dated September 17, 1853. Sealed March 17, 1854.

2174. THOMAS RESTELL, of the Strand, Chronometer Maker, for

Improvements in opening and closing ventilating louvres.—Dated September 19, 1853. Sealed March 18, 1854.

2194. THOMAS WEST WALKER, of Hanley, Stafford, Potters' Manager, for Certain improvements in the manufacture of crates made of wood for the use of potters.—Dated September 22, 1853. Sealed March 18, 1854.

2228. MICHEL OVIDE BERNARD LESAGE, of Paris, for Certain improvements in hydraulic engines.—Dated September 28, 1853. Sealed March 18, 1854.

2233. THOMAS WILLIAM KENNARD, of Duke-street, Adelphi, Middlesex, Civil Engineer, for Improvements in constructing piers and foundations under water.—Dated September 29, 1853. Sealed March 18, 1854.

2332. WILLIAM MUIR CAMPBELL, of Glasgow, Furnace Builder, for Improvements in earthenware kilns.—Dated October 11, 1853. Sealed March 18, 1854.

2505. ANDREW MACLURE, of Walbrook, London, for Improvements in lithographic printing presses.—Dated October 29, 1853. Sealed March 18, 1854.

2651. JAMES WILLS MAYTE, of Gate-street, Lincoln's-inn-fields, Middlesex, Engineer, for Certain improvements in self-feeding furnaces.—Dated November 16, 1853. Sealed March 18, 1854.

2958. PAUL WAGENMANN, of Bonn Rhenish, Prussia, for Improvements in the manufacture of liquid hydro-carbons and paraffine.—Dated December 20, 1853. Sealed March 18, 1854.

3008. JOHN MACINTOSH, of Pall Mall East, for An improvement in discharging projectiles.—Dated December 28, 1853. Sealed March 18, 1854.

57. ELMER TOWNSEND, of Boston, America, for Improvements in machinery for sewing cloth, leather, or other material.—Dated January 10, 1854. Sealed March 18, 1854.—(A communication.)

101. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall, Managing Director of Price's Patent Candle Company, for An improvement in the manufacture of candles and night lights.—Dated January 16, 1854. Sealed March 18, 1854.

108. EDWARD HIGHTON, of Regent's-park, Middlesex, Civil Engineer, for Improvements in suspending the wires of electric telegraphs.—Dated January 17, 1854. Sealed March 18, 1854.

134. NEHEMIAH HUNT, of the State of Massachusetts, America, for Improvements in machinery for sewing cloth or other material.—Dated January 19, 1854. Sealed March 18, 1854.—(A communication.)

147. HENRY WATSON, of High Bridge, Newcastle-upon-Tyne, for Improvements in water-closets.—Dated January 21, 1854. Sealed March 18, 1854.

178. JOHN RIDGWAY, of Cauldon-place, Stafford, China Manufacturer, for Certain improvements in the method of generating and applying heat to kilns, ovens, and furnaces, for manufacturing purposes.—Dated January 24, 1854. Sealed March 18, 1854.

2181. FERDINAND POTTS, of Birmingham, Tube Manufacturer, for Improvements in the manufacture of taper tubes, and in the apparatus connected therewith.—Dated September 20, 1853. Sealed March 20, 1854.

2184. HENRY NEEDHAM, of Wardour-street, Middlesex, Gunmaker, for Improvements in revolving fire-arms.—Dated September 20, 1853. Sealed March 20, 1854.

2190. JAMES BALDWIN, of Birmingham, Paper Manufacturer, for Improvements in the making of paper bags.—Dated September 22, 1853. Sealed March 22, 1854.

2191. FREDERICK GRACE CALVERT, of Manchester, Analytical Chemist, for Certain improved processes for separating emery from other matters.—Dated September 22, 1853. Sealed March 22, 1854.

2235. PETER ARMAND LE COMTE DE FONTAINEMOREAU, of South-street, Finsbury, for Improvements in treating certain exotic plants for the production of a fibrous substance known in commerce by the name of vegetable silk.—Dated September 30, 1853. Sealed March 22, 1854.

2293. JAMES BULLOUGH, of Accrington, Lancaster, JOHN WALMSLEY, and DAVID WHITTAKER, of Blackburn, in the same county, for Improvements in machinery or apparatus for warping and sizing, or otherwise preparing, yarns or warps to be woven.—Dated October 7, 1853. Sealed March 22, 1854.

2353. WILLIAM MUIR CAMPBELL, of Glasgow, Furnace Builder, for Improvements in potters or earthenware kilns.—Dated October 13, 1853. Sealed March 22, 1854.

2411. ROBERT SHAW, of Glasgow, Calico Printer, for Improvements in writing instruments.—Dated October 19, 1853. Sealed March 22, 1854.

2521. JOHN CROWLEY, of Sheffield, Iron Founder, for Improvements in the construction of ovens and furnaces.—Dated November 1, 1853. Sealed March 22, 1854.

2779. LOUIS ALEXANDRE MICHEL, of Paris, Merchant, for A system of apparatus for sawing and breaking sugar.—Dated November 29, 1853. Sealed March 22, 1854.

25. WILLIAM RIGBY, of Glasgow, for Improvements in steam hammers and pile-driving machinery.—Dated January 5, 1854. Sealed March 22, 1854.

35. JOHN DAVIES MORRIES STIRLING, of the Larches, near Birmingham, Esquire, for Improvements in the manufacture of iron.—Dated January 6, 1854. Sealed March 22, 1854.

71. HENRY BEAUMONT LEESON, of Greenwich, M.D., for Improvements in gas-burners.—Dated January 11, 1854. Sealed March 22, 1854.

165. HENRY SEEBOHM, of Esholt, near Leeds, for Improvements in combing wool, goats' hair, alpaca, cotton, and other fibrous material.—Dated January 23, 1854. Sealed March 22, 1854.

205. THOMAS THURLBY, of Guildford-street East, Spafields, Middlesex, for Improvements in the means of effecting instant communication between distant points of railway trains.—Dated January 27, 1854. Sealed March 22, 1854.

2198. CHARLES ALEXANDER, of Albany-road, Camberwell, Surrey, for A certain manner of preparing marquetry, and all other kinds of inlaid work, in veneers of various thicknesses, and for fixing the same to walls and ceilings, of whatever kind, and in or upon floors of wood, stone, or metal, and for rendering such floors water and fire-proof.—Dated September 23, 1853. Sealed March 23, 1854.

2200. ROBERT VARVILL, of High Ousegate, York, Wholesale Ironmonger, for An improved mortising machine.—Dated September 23, 1853. Sealed March 23, 1854.

2210. JOSEPH ELLISDON, of London, Designer and Cabinet Maker,

for Improvements in chairs, whereby they are rendered more portable, and can be converted into other useful articles of household furniture. —Dated September 26, 1853. Sealed March 26, 1854.

2217. ISAAC BERRY, of Lower Mosley-street, Manchester, Embosser and Finisher, and WILLIAM GREEN, of Islington, in the county of Middlesex, Engineer, for Improvements in treating, stretching, or finishing textile fabrics, and in machinery or apparatus for effecting the same.—Dated September 27, 1853. Sealed March 25, 1854.

2248. SAMUEL MURLAND, of Castlewellan, County Down, Ireland, for Certain improvements in machinery for preparing linen yarn.—Dated October 1, 1853. Sealed March 25, 1854.

2280. WILLIAM LITTELL TIZARD, of Aldgate, London, Brewers' Engineer, for Improvements in thermometers and other like indicators. —Dated October 5, 1853. Sealed March 25, 1854.

2320. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in railway switches.—Dated October 10, 1853. Sealed March 25, 1854.—(A communication.)

2418. ALEXIS DUSSUC, of Grove-place, Brompton, Gentleman, for An improved machine for digging and cultivating land.—Dated October 19, 1853. Sealed March 25, 1854.

2463. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for An improved construction of printing press.—Dated October 25, 1853. Sealed March 25, 1854.—(A communication.)

2473. EDWARD JOSEPH HUGHES, of Manchester, for Improvements in machinery or apparatus for sewing or stitching.—Dated October 26, 1853. Sealed March 25, 1854.

2494. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in the manufacture of coloured and ornamented fabrics.—Dated October 27, 1853. Sealed March 25, 1854.—(A communication.)

2564. WILLIAM EDWARD NEWTON, of Chancery-lane, Middlesex, Civil Engineer, for Improved machinery for crushing ores and separating therefrom gold, silver, or other metals contained therein.—Dated November 4, 1853. Sealed March 25, 1854.—(A communication.)

2570. JOHN BANKS NICKLIN, of Bartholomew-lane, London, Merchant, for Improved gelatinous or glutinous compounds for lubricating railway and other machinery.—Dated November 5, 1853. Sealed March 25, 1854.

2839. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for Improvements in fire-arms and ordnance.—Dated December 6, 1853. Sealed March 25, 1854.—(A communication.)

3009. JOHN BARNES, of Church, Lancaster, Manufacturing Chemist, for A certain improvement or improvements in dyeing and cleansing cotton, silk, wool, and other fabrics.—Dated December 28, 1853. Sealed March 25, 1854.

3019. JAMES WILLIAM CROSSLEY, of Brighouse, Halifax, York, Dyer and Stuff Finisher, for Improvements in the production of surface finish to certain descriptions of fabrics, composed of worsted, cotton, or silk, or combinations thereof.—Dated December 29, 1853. Sealed March 25, 1854.

THE

REPERTORY

OF

.TENT INVENTIONS.

5. Vol. XXIII. ENLARGED SERIES.—MAY, 1854.

ation of the Patent granted to James Robert er, *of Lancefield House, Glasgow, in the County of rk, Mechanical Engineer and Iron Ship Builder,* William John Macquorn Rankine, *of Rosebank e, in the Parish of Rutherglen, and County aforesaid, Engineer, for Improvements in Engines for Develop- Mechanical Power by the Action of Heat on Air and Elastic Fluids.*—Dated June 9, 1853.

WITH AN ENGRAVING.

ll to whom these presents shall come, &c., &c.— gines which this invention is calculated to improve se which develop mechanical power applicable to ring of any kind of machinery by successively heat- ting, cooling, and condensing a portion or portions r any other elastic fluid in such a manner that the n takes place at a higher temperature, and the con- n at a lower temperature, and which are known by es of air-engines and caloric-engines.

ngine which we will now describe for the purpose ing the nature of the improvements proposed by us,

and which is represented in the annexed drawing, consists partly of parts and combinations of parts resembling those which have heretofore been used in engines of the class referred to, and in steam-engines, and partly of parts and combinations of parts which we claim as our invention for the improvement of such engines, and which we shall hereinafter specify and claim in detail.

The arrangement of the different portions of the engine shown in the drawing is one of many practicable arrangements which we select as being well adapted to display all the essential parts of the engine at one view. It is obvious that the essential parts of the engine being properly connected with each other may be arranged in any other way which may be found best suited to the situation in which it is to be used and the work which it is to perform. The framework by which the working parts of the engine are to be supported is omitted from the drawing, because it involves nothing new or peculiar, and would interfere with the distinct representation of the working parts.

Fig. 1, represents a vertical section of some portions of the engine, and an elevation of others.

Figs. 2, 3, 4, and 5, are plans upon a larger scale of detached portions, to be afterwards more particularly specified.

In fig. 1, A, is a vertical section of a cylinder containing a piston, B, fixed on a piston-rod, C, which traverses a stuffing-box, *b*, and is connected by means of a connecting-rod, D, with a crank, E, and gives motion to a shaft, F, which may be used to drive any machinery, and on which is a fly-wheel not shown in the drawing.

G, G, are guide-rollers for the cross-head of the piston-rod.

Besides the mode here shown of connecting the piston with the crank, any of the other modes used in steam-engines and air-engines might be employed.

H^1, is a passage connecting the top of the cylinder with a strong air-tight receiver, K^1, the body or central part of which is cylindrical, and is shown in section in fig. 1.

The uppermost part of this receiver consists of a number of tubes of brass or other suitable metal, open at the bottom, where they are strongly fixed in a plate, *j*^{1}. These tubes are to be surrounded by water circulating in a tank, O^1. Their arrangement is shown on an enlarged scale in the plan, fig. 2. Three of those tubes marked I^1, are pro-

vided with stuffing-boxes at the top, being intended for the passage of rods to be afterwards described. The remainder, marked i^1, are closed at the top, and it is intended that the air or other gas should be cooled in them.

The lowest part of the receiver, K^1, consists of a number of tubes of brass or other suitable metal, marked k^1, arranged in the manner shown on an enlarged scale in the plan, fig. 3, closed at the bottom and open at the top, where they are strongly fixed in a plate, l^1. It is intended that the air or other gas should receive heat through them by conduction from the flame from a furnace circulating in a flue, L^1, around and between the tubes.

The plate, l^1, is protected from the action of the flame by a fire-clay shield, o^1.

M, is a main-flue conducting the flame from a furnace; m^1, a branch-flue leading into the flue or chamber, L^1; n^1, a branch-flue leading from this chamber to a main-flue, N, which conducts the products of combustion to the chimney.

P^1, is a plunger of sheet-iron or other metal divided into compartments, so as to be at once light and strong, as shown on an enlarged scale in the plan, fig. 4. Some of these compartments are to be air-tight, and to be filled with brick-dust, fire-clay, or some other substance which conducts heat slowly; but one or more compartments are to extend through the plunger so as to form a passage for air or gas, and are to be filled with a series of layers of wire-gauze or thin perforated metal-plates, strips, or wires, or of some substance capable of conducting heat rapidly, and so formed and arranged as to expose a large surface for the communication of heat to and from the air which may pass through. One such passage, occupied as described, is represented by p^1, in the section and plan.

The plunger, P^1, is to be made to fit the body of the receiver, K^1, as closely as is consistent with its moving up and down with as little friction as may be against the sides of the receiver. It is to be suspended by one or more rods from a beam, R, which moves on a pivot, r. In the engine shown in the drawing there are two such rods for this plunger, marked Q^1, Q^1. They work through stuffing-boxes at the top of two of the tubes, I^1, and are attached to a cross-bar, which is hung from the beam, R, by a rod, J^1, and is so formed as to allow a third rod, T^1, to pass freely through it for a purpose to be afterwards stated.

This rod is partly concealed by the rod, J¹. And the tubes, I¹, is traversed by this rod. The tubes, of which only are shown in section, are occupied by drical rod-shaped metal-plungers, q^1, which, being a as shown in the plan, fig. 4, are fixed to the top plunger, P¹, forming part of it, and moving along with fitting the tubes, i^1, loosely, so as to leave a pass air or gas all round each tube about an eighth of wide.

The rod, T¹, suspended from the beam, U¹, works a stuffing-box at the top of one of the tubes, descending through that tube traverses also the c the plunger, P¹, by a passage wide enough to let without friction, and is attached to the heat-screen,

This heat-screen consists of a circular-plate, s^1, brass, or other suitable metal, pierced with holes, the cylindrical part of the receiver, K¹, but not so to produce friction, and of a series of rod-shaped pl t^1, of brass, copper, or other suitable metal, fixed plate, and moving with it, and capable of filling th k^1, except a passage of about an eighth of an i round each tube. This heat-screen is shown in pla enlarged scale in fig. 5, where the holes in the plate, indicated by small full circles, the rod-shaped plung by dotted circles, and the rod, T¹, by which the heat is suspended, by a dark spot.

The object of the heat-screen is to regulate the mission of heat from the flame in the chamber, L¹, air or other gas in the lower part of the receiver, that it shall take place wholly or chiefly during the sion of this air or other gas, which is the perio favourable for the development of mechanical pow shall be wholly or almost wholly cut off at other time the heat would be wasted, or would impede the a the engine.

The rods, q^1 and t^1, may be made hollow for the lightness, but the hollows should be air-tight.

The form of the heat-screen shown in the drawi result of the tubular form of the bottom of the with which it is made to correspond. Should the of the receiver be made of any other shape the hea must be made to fit it. In like manner the top plunger, P¹, is to be made to fit the top of the rece

The beam, U¹, from which the heat-screen hangs

rod, T', moves on the axis, u'. V', is a counterpoise, to balance wholly or partially the weight of the heat-screen. In stationary engines a preponderance may be allowed to the heat-screen sufficient to make it descend to the bottom of the receiver from the top of its stroke with rapidity, but not with violence. In marine and locomotive-engines the balance of weight should be exact, and the descent of the heat-screen should be produced by means of a spring or some other suitable mechanical contrivance.

W', is a catch turning on a pivot, w', in the beam, U', resting against a stud, v', and kept in its place by a spring, s'. The roller, X', at the end of the beam, R, acting on this catch, raises the beam, U', and heat-screen, S', during the latter part of the up-stroke of the plunger, P'. When the plunger is near the top of its stroke, the catch escapes from the roller, and the heat-screen descends. During the down-stroke of the plunger, P', the roller pushes the catch down into a position similar to that shown by dotted lines at w', and passes it, when the catch springs back to its original position. The counterpoise end of the lever, U', is omitted, the better to display some other parts of the engine.

At the side of fig. 1, towards the left hand, the catch is supposed to have just escaped from the roller, and the heat-screen to be in the act of falling. At the side towards the right hand, the heat-screen is supposed to be in its lowest position.

Y, is an eccentric wheel for working the plungers and heat-screens. By means of the rod, Z, it gives a reciprocating motion to the link, A, *a*, which turns on a pivot, at *b*, *a*. In this link is fitted a slide, *b*, *b*, furnished with a spring-catch for fixing it at various notches on the link. This slide is connected by the rod, B, *b*, with the end of the lever, C, *c*, which is either part of the beam, R, or fixed to the same axis. Thus a reciprocating motion is communicated from the eccentric to this beam.

The handle, D, *d*, serves to shift the slide, *b*, *b*, to various positions in the link. When the slide is in the position shown in the drawing, the shaft, F, will revolve in the direction shown by the arrow; when at the centre of the link, the engine will stop; when at the opposite end, the motion will be reversed; when in intermediate positions, the speed will be moderated.

The most economical mode, however, of working at a reduced speed will be to close partially the dampers with

which the flues are to be provided, and thus to moderate the combustion in the furnace.

The passage, H², leads from the lower end of the cylinder to the receiver, K², which, with its tubes, water-tank, flues, plunger, heat-screen, rods, beams, and other appurtenances, is to be similar to that already described. It is shown in elevation only. The visible parts of the engine specially belonging to the lower end of the cylinder are marked with the same letters with the corresponding parts belonging to the upper end, and distinguished by having the fig. 2 affixed instead of 1.

E, *e*, is a rod attached to the eccentric ring for working a forcing pump, F, *f*, by which air or the other gas employed is to be compressed into the magazine, K, *k*, behind the cylinder, both to obtain a sufficient pressure, and to supply the loss by leakage. This forcing pump being behind the cylinder, its position is shown by dotted lines. H, *h*, is an adjusting screw, by which the rod, E, *e*, can be lengthened or shortened, so as to increase or diminish or altogether to stop the supply of compressed air or gas forced into the magazine at each stroke of the pump.

L, l^1, L, l^2, are pipes leading from the magazine to the passages, communicating with the two ends of the cylinder respectively, and furnished with valves opening upwards, so that whenever the pressure in either end of the cylinder falls below that in the magazine, a supply of air or gas may pass to the end of the cylinder which requires it.

M, m^1, M, m^2, M, m^3, are safety-valves for the two ends of the cylinder and for the magazine respectively.

Another forcing pump, which needs not be shown, as it presents nothing peculiar, is concealed behind the magazine, and worked by another rod from the eccentric ring. Its function is to supply a stream of cold water to each of the tanks, o^1, o^2, which, gradually rising amongst the tubes contained in those tanks, escapes finally by the waste pipes, O, o^1, O, o^2, which should be conducted to some convenient outlet. In locomotive and marine engines those tanks should be subdivided by thin perforated partitions to check agitation of the water. Another mode of cooling the tubes is to sprinkle them with water from a number of jets.

Communicating with the two ends of the cylinders and with the air-magazine respectively are fixed three pressure gauges, Q, q^1, Q, q^2, Q, q^3. They should be capable of indicating pressures up to 200 lbs. on the square inch.

P, p^1, P, p^2, are outer casings for the lower part of the cylindrical body of the receivers, K^1, K^2, filled with brick-dust, engine-ashes, or some other slow conductor of heat.

R, *r*, R, *r*, R, *r*, R, *r*, are dampers for the flues.

In the engine shown in the drawing, the receivers are vertical, but it is obvious that they might be placed horizontally, the plungers and heat-screens being supported on rollers, and the motion of the heat-screens towards the hot sides of the receivers being produced by springs or other mechanical contrivances.

Having thus described the parts of the engine, and their connexion with each other, we shall now describe how it is to be set in motion and worked.

When the engine is at rest, the pressures on the top and bottom of the piston will be equal, and it will place itself nearly in the middle of the cylinder, being the position shown in the drawing. The slide, *b*, *b*, being at the middle of the link, A, *a*, the beams, R, U^1, and U^2, will all be horizontal, the plungers will be in the middle of their respective receivers, and the heat-screens at the bottom.

If the fire be now lighted, the flame circulating in the chamber, L^1, and the corresponding chamber for the other receiver, will heat the tubes, k^1, the rods of the heat-screen, t^1, and the film of air between them; also the corresponding parts and film of air belonging to the other receiver. At first, the greater part of the heat will be accumulated in these bodies, a very small portion only reaching the air above the heat-screens. The effect in each receiver being the same, the piston will still be pressed equally on both sides, and will continue at rest.

Suppose the crank to stand as shown in the drawing, and that it is required to set the engine in motion in the direction indicated by the arrow. The engine-man must loosen the spring-catch of the slide, *b*, *b*, and by means of the handle, D, *d*, move it to the upper end of the link. This motion will throw the beam, R, into the position shown in the drawing. It will lower the plunger of the receiver, K^2, sending the air through the passage in that plunger to the top of the receiver, and into the tubes contained in the tank, O^2, so that such heat as may have reached it from the flame will be abstracted. At the same time the plunger, P^1, will be lifted to the top of the receiver, K^1, sending the air out of the tubes, i^1, and the upper portion of the body of the receiver down through the passage, P^1. The heat-

screen, s^1, will also be lifted and dropped, the effect of which will be, that the air in the lower part of the receiver will be made to circulate rapidly over the surface of the hot rods, t^1, and through the hot tubes, k^1, and will receive a certain quantity of heat. This heated air expanding will transmit its pressure and its motion through the passage, H^1, to the air in the cylinder, A, and finally to the piston, B, and the engine will begin to move.

During the working of the engine, the following is the succession of changes undergone by the air in the receiver, K^1:

During the end of the down-stroke and beginning of the up-stroke of the piston, the heat-screen lies at the bottom of the receiver. The plunger, P^1, descends, and the air, with the exception of a trifling quantity, passes through the passage, p^1, and gives out a large portion of its sensible heat to the wires, strips, or sheets of metal or other conducting bodies contained in that passage. The remainder of the excess of the heat of the air above that of the water in the tank, o^1, is abstracted by the surface of the tubes, i^1, and rods, q^1. The up-stroke of the piston causes this air to be compressed; this compression produces heat, which is also abstracted by these rods and tubes. This heat, were it not so abstracted, would increase the elasticity of the air, and oppose the motion of the piston.

During the end of the up-stroke and beginning of the down-stroke, the plunger, P^1, rises, the air descends through the passage, p^1, and recovers the greater part of the sensible heat formerly lost from the wires, or metal sheets, or strips, or other conducting substances. During the first half of the down-stroke, the heat-screen, s^1, is raised and dropped, and the air, by circulating over its rods, t^1, and through the hot tubes, k^1, acquires the remainder of the sensible heat necessary to elevate its temperature, and also the latent heat necessary to expand it. This completes the cycle of operations in the receiver connected with the upper end of the cylinder.

In the other receiver, like operations take place, substituting only the up-stroke for the down-stroke, and *vice versâ*.

The effect of these operations is of a similar nature to that which takes place in all engines driven by the action of heat on an elastic substance, viz., that the substance is alternately expanded at a higher temperature and contracted at a lower, so that the power developed by the expansion is

greater than the power consumed by the contraction, and a surplus of power remains to drive machinery.

When the engine begins to work, should the cylinder and receivers be filled with air or other gas at a pressure not sufficiently great to perform the required work, the engine must be disconnected from the machinery it is intended to drive, and the pump-rod, E, *e*, being adjusted by the screw, H, *h*, so that the piston of the pump shall nearly touch the bottom of the barrel at each stroke; the whole surplus power of the engine will be employed for some minutes in filling the magazine, the receivers, and the cylinder with compressed air. When the gauges indicate that the required pressure has been attained, the engine may be connected with the machinery to be driven, and the pump-rod, E, *e*, shortened by means of the screw, H, *h*, so as to supply enough of air only to make up for leakage, which condition will be indicated by the pressure gauges.

The motion of the engine is stopped by moving the slide, *b*, *b*, to the centre of the link, and reversed by moving it to the opposite end of the link.

The steadiness of motion may be increased, as in the case of steam-engines, by using two or more engines to drive the same shaft, their motion being so adjusted as to produce the nearest possible approach to uniformity of action on the shaft.

We would remark, that it will be evident that many of the details may be varied without departing from the peculiar character of our invention as herein described, and it is obvious that the principles and mode of construction and action described in this specification as applied to a double-acting engine for driving a revolving shaft may also be applied to a single-acting engine, by causing the air to act upon, and employing the parts belonging to, one side of the piston only.

Having thus described the nature of our invention, we would have it understood that we make no claim to any of the mechanical parts separately. But we claim as the improvements which constitute the peculiarity of the engine,—

In the first place, the invention and adaptation of what we have called a heat-screen, the form of which may be varied, and the means of giving motion thereto may be also varied; the said heat-screen being separate and distinct from the plunger, which drives the air or other gas from

the hot to the cold end of the receiver, and *vice versâ*, being adapted to the following purposes:—

1. To screen the principal portions of the air or o gas from the communication of heat from the furnac source of heat at those times when that heat would im the motion of the engine, that is to say, when the a other gas is being passed towards the cold end of receiver to be cooled, when it is not being expanded, when it is being compressed.

2. To receive and store up in its own material at times the heat communicated from the furnace.

3. To permit and accelerate the communication of to the air or other gas at the time when it is most effe in developing mechanical power, that is to say, when air or other gas is being expanded.

In the second place, we claim the adaptation of tul receivers for the purpose of heating and cooling the a other gas in the manner described in this specification, is to say, by the aid of rod-shaped heat-screens or plun nearly filling the tubes, and serving, by being moved and in, whether by the mechanism shown in the drawin by any other suitable mechanism, to admit and expel air or other gas, and promote its circulation over the h or cooled surface.

We do not, however, claim the invention of tubes means of increasing heat-conducting surface, but simpl adaptation of tubes to engines worked by the action of on air or other gas by the aid of the rod-shaped heat-sc or plungers before described.—In witness, &c.

JAMES R. NAPIER.
W. J. MACQUORN RANKIN

Specification of the Patent granted to JOHN SHAE PER *of Bury, in the County of Lancaster, Civil Enginee Improvements in the Permanent Way of Railwa* Dated August 1, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., My invention relates to an improved form of that p the permanent way of railways called points or swi

and consists in so forming the rails which constitute such apparatus that they can be turned over and used on either side, (that is to say,) the two moving or tongue rails are cut or otherwise formed to a pattern which will admit of their being adapted either side up, so that when the one surface is worn out the other may be brought upward for the carriages to run upon, and in like manner I construct the fixed rails which constitute the other portions of switches.

Having thus set forth the main feature of the invention as described in my Provisional Specification, I will proceed to illustrate the same by aid of the accompanying drawing.

Fig 1, is a horizontal representation of the switches as they are adapted to a railway. This view does not in itself particularly show the nature of my invention, but will serve to illustrate the same in combination with fig. 2, which is an end elevation of one of the switches, *a*, *b*, explaining the sections thereof at various points, which sections are coloured with various tints in order to make them more evident. Upon fig. 1, are marked the several numbers, 1, 2, 3, 4, 5, 6, 7, a section taken at any one of which points will answer to the shape included between the corresponding numbers upon fig. 2. It will be perceived that these sections gradually increase in breadth as the wheels of the carriage lose their bearing upon the fixed rail, that at 7, being of the full breadth. The upper part, A, and the lower part, B, are of the same form, so that when the one is worn out it may be turned up-side down, and moved to the other side, as from *a*, to *b*, which latter being also in like manner shifted so as to occupy the place of *a*, two new surfaces will be obtained as bearings for the train. After the same manner I form the fixed rails, *c*, of the switch, so that they may be reversed when desired, and present the proper relative shapes to the moveable parts, *a*, *b*. I have in the drawing shown a particular shape of rail, but I do not confine myself thereto, as my invention may be adapted to other forms, and in combination with such sleepers or other bearings as may be desired. I would also observe, that the improved form of switch may be manufactured by rolling, hammering, or by other suitable process.

Having thus described and ascertained the nature of my said invention, and the manner in which the same is to be performed, I desire it to be understood that I claim, as

secured to me under the above in part recited letters patent, so shaping or constructing the rails of points or switches that they may be used either side uppermost.—In witness, &c.

JOHN SHAE PERRING.

Specification of the Patent granted to ANTOINE BURQ, *of Paris, Chemist, for Certain Instruments, Apparatus, and Articles for the Application of Electro-Galvanic and Magnetic Action for Medical Purposes.*—Dated April 4, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—It has been discovered by medical men, that the outward application to the human frame of various metals, either in a pure or alloyed form, is more useful and efficacious than the application of galvanic currents for the same purpose. The magnetic, electric, or other like properties possessed by various metals differ much in quality and degree, and the effects resulting from their application also vary with circumstances, such as the state of health of the patient, age, &c. And thus it happens that the application of copper may have no beneficial effect on one patient, while it may benefit another, or *vice versâ*; steel may be injurious to one, and useful to another; and the judicious combination of metallic bodies forms the great secret of success in this art. And I find that copper and brass, and English and German steel, form useful combinations for medical applications, more especially in cases of cholera, when employed in the manner and by means of the instruments and apparatus hereinafter described. And my invention consists of the manufacture and use of certain instruments and apparatus made of these four metals, to be applied to the human frame for the purpose of giving to it magnetic, electric, or magneto-electric action.

Fig. 1, represents two rings to be worn on the fingers, one-half of the ring, A, is made of brass, and the other half of copper. The ring, B, is composed of one-half English steel, and one-half German steel. These rings may be worn either upon one finger, or upon two fingers of the same hand.

Fig. 2, represents a medal to be suspended by a riband, and worn round the neck; the plate, C, is made one-half of copper, and one-half of brass; the plate, D, is one-half English steel, and the other half German steel; a disc of leather or cloth is placed between the metals to prevent galvanic contact.

Fig. 3, represents a series of medals, made of copper, brass, English and German steel, in a manner similar to the foregoing. These series of medals are intended to be used more particularly in conjunction with the metallic bath, hereinafter described, or in cases where the metals are required to be kept in a damp or moistened state.

Fig. 4, represents a form of metallic combinations, to be worn as a bracelet or armature, and is composed of small plates of copper, brass, English and German steel; these plates are rivetted together, a plate of copper to one of English steel; a plate of brass to one of German steel; and in order to prevent galvanic contact, pieces of cardboard are interposed between the plates, leaving a space in the centre, through which may be passed an elastic band having a snap or clasp at the ends, for the purpose of securing it to the wrist or arm. Each of the metal plates should have stamped upon its surface some device or design, so as to give them a certain degree of roughness, which sometimes greatly increases their utility; in this or any other similar form, combinations of the metals may be worn by females as bracelets, head-bands, necklaces, &c.

Fig. 5, represents a necklace for children, the beads of which are formed of copper, English steel, brass, and German steel, threaded alternately upon a string or riband. Any of these articles, where they are intended to be worn as ornaments, may, if required, be covered with a film of gold or silver, to give them a more pleasing appearance.

Fig. 6, represents a corset busk; one side, E, is formed of two pieces of brass and copper, and the other side, F, of English and German steel; or it may be made with the four metals upon each side, but this mode does not offer any great advantage over the other.

Fig. 7, represents an instrument for striking the surface of the body to increase the energy and activity of the muscles. It consists of a bundle of wires formed of equal portions of copper, brass, English and German steel wire, to which a suitable handle is attached.

Fig. 8, represents an Indian strygil for rubbing the surface of the body; G, G, are wooden or ivory wheels, the peripheries of which are alternately covered with copper, brass, English and German steel.

Fig. 9, represents what I term metallic wadding, or cataplasm; it is formed of a piece of cotton wadding covered with gum, or a solution of sugar, or molasses, upon which is spread a quantity of filings or turnings of copper, brass, English and German steel. The gum or sugar prevents the oxydation of the metals, and gives to the mass a certain degree of suppleness. To prevent the asperities of the metals injuring the skin, the surface of the poultice may be covered with a thin layer of wadding.

Fig. 10, represents an armature or ring for fitting the thigh, leg, or arm. The figures show a front and back view of the armature; they are made of copper, brass, English and German steel; the two portions are kept together by an adjustable strap at the back, marked, *b*, *b*; the front is secured by the hasps, *c*, *c*. If the whole of the limb is to be covered with metal, then two or more of these armatures must be used.

Fig. 11, represents a bath formed of the four metals, copper, brass, English and German steel, in which the patient is to be placed; and, where necessary, the greater portion of the body may be covered with filings or turnings of the metals above named, either in a dry or wet state; or a series of medals, such as represented by fig. 3, and forming a sort of chain, may be wound round the limbs of the patient, with the view of increasing the surface exposed to metallic contact.

Having thus described the nature of my invention, and the manner of carrying the same into effect, I wish it to be understood that I do not bind myself to the precise details hereinbefore given. But I claim the use and manufacture of the instruments, apparatus, and articles formed of a combination of metals as herein shown and described, for application to the surface of the human body as curative agents, or as preventives of disease.—In witness, &c.

ANTOINE BURQ.

Specification of the Patent granted to JOHN CROSS RICHARDSON, *of Lily-hill, near Manchester, in the County of Lancaster, Manufacturer, for Certain Improvements in Machinery or Apparatus for Winding Yarn.* — Dated June 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.— My invention relates to the machinery commonly termed the "pin-winding-frame," and which is employed for winding the yarn or weft from the hank on to the pin-bobbins for the use of the weaver.

In consequence of the conical form of the bobbins the speed of the yarn or thread is constantly varying in these machines, as it is alternately being wound on to the larger or smaller diameter of the bobbin, whereby a great amount of breakage is caused, owing to the constant fluctuation in the speed, so that some descriptions of weft cannot be wound by or upon the said machines.

The first part of my invention consists in causing the spindles to vary their speed as they are "taking up" or winding on to the larger or smaller diameter of the bobbin, so as always to "take up" or wind on the yarn or thread at an uniform rate of speed, by which means the speed and consequent strain or stress upon the yarn or thread being at all times equal a great saving is accomplished, and I am enabled to wind yarns or threads of fine counts as well as coarse ones upon this machine. I effect this by driving the spindles by means of a pair of conical pulleys of the same taper or bevel as the bobbin, the driving-strap being guided from the larger to the smaller diameter, and *vice versâ*, as required, by any suitable means.

The second part of my invention consists of a conical "presser" in which the bobbin revolves, by the use of which I am enabled to make a firmer and more solid bobbin than heretofore, and the pressure on the bobbins and spindles is rendered uniform, which has not been the case hitherto.

In order more fully to describe the particular nature of my invention, and the machinery or apparatus for carrying the same into practical effect, I have attached to these presents a sheet of drawings illustrative of the same, drawn upon a scale of about two inches to the foot, and have

marked thereon letters of reference corresponding those in the following description thereof:—

Description of the Drawings.

Fig. 1, is a side or front view of part of a pin-wi frame; and

Fig. 2, is an end view of the same. Similar lett reference are marked upon corresponding parts in figures.

In fig. 1, *a*, *a*, *a*, is the framing; *b*, the driving having a drum, b^1, fixed upon it; *c* and *d*, the c pulleys; *e*, the main-drum, which drives the spindles, *g*, is a pinion fixed upon the shaft of the drums, *d* working into a small wheel, *h*, which carries upon its another pinion, *i*, working into the large wheel, *k*, wheel causes the driving-band to move along the c pulleys, *c* and *d*, by means of the stud, *l*, fixed ne centre, forming a crank acting upon the spindle, means of the connecting-rod, *n*, and the arm, *o*. A wheel, *k*, revolves, the reciprocating motion given arm, *o*, by means of the stud, *l*, and connecting-rod, *n*, municates a corresponding motion to the guides, *p* which shift the strap, *r*, alternately from end to end pulleys, increasing the speed of the drum, *e*, and spi *f*, *f*, when winding on towards the smaller diameter reducing the speed when winding on to the larger dia *s*, *s*, are the conical pressers in which the bobbins re and which are kept in their place by a cord and weigh These conical pressers are shown on a larger scale i 3 and 4. The bobbins are pressed upwards by a cor weight.

Having thus described the nature and object c invention, together with the manner of carrying the into practical effect, I would remark, in conclusion, claim as my invention,—

First, the application of conical drums to equalis speed of the yarn or thread when being taken up or on to the bobbins; and

Secondly, the conical "pressers" in which the bo revolve by the means hereinbefore more particular forth and described, and clearly exhibited in the dra annexed.—In witness, &c.

JOHN CROSS RICHARDS

Specification of the Patent granted to EDGAR BREFFIT, *of Castleford, in the County of York, Glass Manufacturer, for Improvements in the Manufacture of Glass House Pots.*—Dated June 18, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—In the ordinary mode of manufacturing glass-house pots for melting glass the pot is made of clay, and is supported upon a base of stone or wood or other suitable material. By this arrangement the sides of the pot being more exposed to the air become dry sooner than the bottom, and the pot is thus rendered liable to crack. To avoid this defect I construct the base with a separate central portion of somewhat less diameter than the base of the pot, and when the clay has acquired a certain degree of strength and consistency I remove the central portion, and leave the pot resting upon the exterior part of the base. The bottom being thus exposed to the air dries quicker than when resting upon the ordinary base. The whole pot is thus more uniformly exposed to the air without its removal from the base on which it is built, and may safely be dried quicker than by the ordinary method. The base is made of iron or of stone or other suitable material. The central moveable portion of the base and the exterior part of the same may each be made of one or more pieces.

Fig. 1, is a vertical section of a glass-house pot standing upon its base.

Fig. 2, is a plan of the base, without the pot. A, is the pot; B, is the external portion of the base; and C, is the internal portion of the same. These parts may be made of cast-iron, strengthened by ribs, as shown in the drawing, or they may be made of any other suitable material. They are supported by three or four blocks, D. The pot, A, is constructed on this base with fire-clay, brought into a plastic state with water, and mixed or prepared in the usual manner; and as soon as the bottom has become sufficiently dry to support its own weight the base is raised a little at its outer edge by means of a lever or crowbar, and the blocks, D, are drawn out a little way so as to allow the central portion of the base, C, to drop out, leaving the pot

resting upon the external ring, B. A support may be placed under the centre of the bottom of the pot to prevent it from sinking with its own weight. The central portion of the base, C, may be left under the pot after being lowered from it, as hereinbefore mentioned, or it may be removed altogether, and employed with another external ring in the manufacture of another pot in a similar manner.

In lieu of making the base of only two pieces, B and C, as hereinbefore described, it may be made of several pieces. Thus, each of the parts, B and C, may be divided into several segments, and portions removed at pleasure, so that air may be allowed access to the bottom of the pot before it could be removed from the base on which it is built, and before the bottom is sufficiently dry to sustain itself with the aid of the ordinary partial supports. I, however, give the preference to the simpler arrangement first hereinbefore described.

Having now described the nature of my invention, and in what manner the same is to be performed, I wish it to be understood that what I claim as the invention intended to be secured by the aforesaid letters patent is,—

The manufacture of glass-house pots by constructing the same upon a base consisting of an external ring surrounding an internal or central portion, which is afterwards removed to allow of the access of air to the bottom of the pot, as hereinbefore described.—In witness, &c.

EDGAR BREFFIT.

Specification of the Patent granted to AUGUSTE EDOUARD LORADOUX BELLFORD, *of No.* 16, *Castle-street, Holborn, London, for Improvements in Machinery for Pulverizing and Washing Quartz or Ore, and for Amalgamating the Gold contained therein.*—Dated June 17, 1853.—(A communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The nature of the first part of the invention consists in the employment, for the purpose of pulverizing quartz or ore, of a spherical ball placed within a circular basin, whose axis moves in such a way as to describe a cone around an

imaginary fixed axis, but does not cause the basin to rotate. The basin is so formed that the ball nearly fits to its sides. The imaginary axis round which the axis of the basin revolves is intended to be vertical, and consequently the bottom of the basin must always be in a similarly inclined position, though the position of the basin is constantly changing in such a way as to make all the points in any circle described from its axis successively the lowest points in the said circle, every point moving as it were in a circular inclined plane. The ball will always descend by its gravity to the lowest place in the interior of the basin; but as every point in the circle of the basin in which the ball remains commences ascending as it passes the ball, it has a tendency to carry up the ball with it. This tendency is overcome by the gravity of the ball, which causes it to rotate on its axis in the same manner as a ball descending an inclined plane, and always keeps it at the lowest part of the basin, where by its rolling motion it is made to grind and pulverize the material placed in the basin. The peculiar movement of the basin admits of the quartz or ore being kept all towards the working-point of the ball, and keeps the entire mass of its contents constantly and thoroughly agitated, so that all the particles are subjected alike to the action of the ball.

The nature of the second part of my invention consists in the combination with a ball and basin, having such movements as I have described, of an outer basin placed below, with a space between it and the washing basin, moving with the crushing basin, and having communication with it through an opening or openings in the centre, which is or are protected by a screen or screens. This outer basin contains mercury for amalgamating the gold or metal. A constant stream of water is admitted into the crushing basin, and this, combined with the action of the ball, washes and throws all the crushed portions of the matter over the screen, through which the finer portions descend to the outer pan, where the gold or metal amalgamates with the mercury, and from which the quartz or other foreign matter is washed by the stream of water.

The third part of my invention relates to a device for counteracting the too great centrifugal tendency which may be imparted to the crushing ball by the revolution which it is caused to make around the axis of the basin and the imaginary axis round which the former axis moves. The

axis of the basin receives its motion through a crank acts at one end of it, and the increasing centrifugal f the ball is made to shorten the effective length of this and thus reduce the motion of the basin and the incl of the plane which is presented to the ball.

In the accompanying drawing,—

Fig. 1, is an elevation of a machine constructed ac to my improvements.

Fig. 2, is a vertical section of the same at right ar fig. 1.

Fig. 3, is a plan of the same.

Fig. 4, is a plan view, showing the crank through rotary motion is given to the crushing and amalga basins detached from the machine.

Similar letters of reference indicate correspondin in the several figs.

A, is the frame of the machine, in the lower which is supported the driving shaft, B, which o a vertical position and receives motion through pulley, C, from any prime mover. The upper end shaft is forked to receive a block, D, of metal, w pivoted to it by a pivot, *f*, passing transversely throu axis of the shaft. E, is the lower or amalgamating which is intended to be of cast iron of circular for has a hub, *a*, projecting some distance from the in the bottom which receives the shaft, F, on which it is secured. G, is the inner or crushing basin, whic formed as to make a trough or channel, M, all ro bottom to receive the ball. The raised circular part the basin within the trough rests upon a number of l pieces, *b*, *b*, which stand up from the bottom of the E, and it has a hub, *c*, which fits to the shaft and r the hub, *a*. The two basins are secured to each and to the shaft by any suitable means. The circular part, H, of the basin, G, is open, the hub merely united to the trough by radial arms, and th ing is covered by a screen, L.

The upper end of the shaft, F, is suspended at point; the suspension may be made with any joint will admit of its turning freely in any direction. adopted a hook, *d*, and eye, *e*, as being the simpl easiest of construction. The lower end of the shaft nected by a crank to the shaft, B. This crank, ins being a bar or block rigidly connected to the two

consists of a rod, I, which is fitted to work freely in a hole made in the block, D, at right angles to the pivots, *f*; at one end is pivoted a metal box, J, which is bored to receive a journal, *i*, on the lower end of the shaft, F. A spring, *g*, is applied between the block, D, and a shoulder near that end of the rod, I, to which the shaft F, is connected, and another spring, *h*, is applied between the said block and a shoulder at the opposite end of the rod; both these springs exert their force by pushing from the block.

The ball, K, may be of solid cast iron, or, for convenience of transportation, may consist of a hollow cast-iron shell, which may be filled with the heaviest available materials.

The operation of the machine is as follows:—The quartz, ore, or auriferous mineral, after being broken into small pieces, is fed in a suitable quantity to the basin, G, and is there subjected to the action of the ball, K, which fits to the trough or channel, M, in such a way as to leave room for some of the matter under and at the sides of the ball, where it is submitted to a crushing and grinding operation. The stream of water which is let into the trough, G, washes up all the finely pulverized particles, and carries them through the screen, L, where there is a constant overflow to the basin, E, containing the mercury. In the latter basin a constant agitation is kept up by the peculiar motion imparted to it, and by it every particle of the gold or metal is brought into contact with the mercury, and amalgamated with it, while the quartz or other foreign mineral matter is washed away by the constant overflow at the lowest part of the edge of the basin, E. The amalgam is withdrawn from the basin through a suitable valve or trap, *l*, in any part of the bottom. The ball, K, owing to the constant change in the position of the lowest portion of the basin, moves in a horizontal plane in a circle described from the imaginary central axis round which the axis of the basin moves, and thus acquires centrifugal force, which tends to throw the lowest side of the basins from the centre. This centrifugal force is in a certain degree, but not perfectly, counteracted by the gravity of the ball which tends to lengthen the crank, while the centrifugal force tends to shorten it. The shortening of the crank reduces the extent of the motion of the basin and lessens the inclination of the plane down which it may be said to be descending, and thus arrests the centrifugal tendency. The springs, *g*, and *h*, admit of the

lengthening and shortening of the crank, and hold it at a desirable length, when not otherwise unduly influenced, and also serve to prevent shocks to the machine in stopping and starting.

I will here remark, that the lower end of the shaft F, may be attached at a fixed point, and the upper end may be attached to a crank, and this will give motion to the basins similar to the arrangement shown.

I claim, first, the employment for the purpose of pulverizing quartz or ore, or any mineral matter containing gold or other metal, of a spherical ball, K, within a circular basin, G, whose axis moves so as to describe the periphery of a cone, but which does not revolve, the said motion being produced by any mechanical means equivalent to those I have described.

Secondly, the combination, substantially as shown, with a crushing or pulverizing basin, G, moving as I have described, of an amalgamating basin, E, the said amalgamating basin being placed below the said crushing basin, having the same axis and moving with it, and having communication with the said crushing basin through a screened opening in the centre of the same.

Thirdly, connecting the shaft, F, which forms the axis of the basins to the driving shaft by means of a crank, I, whose length is capable of being varied by the increasing or decreasing centrifugal force acquired by the ball, but which is regulated, when the crank is not otherwise unduly influenced, by springs, *g*, *h*, on either side of one of its connexions, substantially as described.—In witness, &c.

AUGUSTE EDOUARD LORADOUX BELLFORD.

Specification of the Patent granted to JOSEPH ILSLEY, *of Lisbon, in the Kingdom of Portugal, Professor of Physics, for An Improved Telegraphic Apparatus.*—Dated June 16, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The object of the present invention is to supersede the use of the electric or magneto-electric current for working telegraphic signals, and to employ in place thereof a column

of air, which is to be confined in a tube or pipe extending from one station to another. To this tube or pipe, which may be placed under ground, is to be adapted an air-pump, syringe, or other suitable apparatus, whereby the column of air may be rarefied and compressed, or otherwise acted on, and made to actuate a signal or indicating apparatus placed at each extremity of the tube. Motion may be transmitted from the column of air in the underground tubes to the index or pointer of the signal apparatus, either by means of a column of mercury, as in common mercurial barometers, or by means of a thin flexible metallic or other plate, or other suitable, collapsible, or yielding medium, which, by yielding when pressure is applied thereto, by means of the column of air in the underground tube, will raise or depress or otherwise act on the said plate or column of mercury or other yielding medium; and this motion of the plate or mercury or other yielding medium is communicated to the index arm by any convenient contrivance, as in the common wheel or aneroid barometers. Or, in place of the column of air being made to act against a thin flexible metallic plate, the pipe containing the air may be made to communicate with a bent or curved flattened tube, similar to those employed in Bourdon's patent barometers and steam or pressure gauges.

In order, however, that the nature and object of my invention may be clearly understood, I have shown in the accompanying drawings two plans of carrying the same into effect.

Fig. 1, is a plan view; and

Fig. 2, a vertical section of one of my improved instruments. *a*, *a*, is a cylinder or syringe, in which works the piston, *b*, *b*. This cylinder communicates by means of the trunk or pipe, *c*, with a close chamber, *d*, *d*, which is provided with a strong glass cover, and in which chamber is placed the indicating apparatus, *e*, *e*, which is constructed precisely upon the principle of the common and well-known aneroid barometer.

Now, as the piston, *b*, is drawn up in the cylinder, *a*, the air becomes rarefied in the chamber, *d*, and the vacuum chamber of the aneroid instrument is allowed to expand and move round the index or needle, *f*, to the right or left of the zero point; when, on the contrary, the piston is pushed down, the needle will be made to move in the oppo-

site direction, and by previously drawing in a small qua
of air through the lateral pipe, *g*, this air will be compr
on the descent of the piston, and cause the needle or
on its return to pass beyond the zero point on the
From this it will be seen that the needle or index m
made to vibrate from left to right, and *vice versâ*, b
slight movement up and down of the piston, *b*, *b*.
short branch pipe, *h*, fig. 1, is for connecting a similar
cating apparatus, situated at any required distance,
the cylinder, *a*, of the present apparatus, by means
gutta percha, metal, or other pipe, placed under grou
protected in any convenient manner, so that by raisi
depressing the piston, *b*, the indices of both apparatu
be made to act simultaneously, and produce similar si
A whistle or other audible signal, *i*, is placed on the
for the purpose of attracting the attention of the atte
when it is desired to transmit a signal. For this pu
the whistle (when the instrument is not in use)
always be left open, so that the attendant at the op
end should (by merely raising the piston to draw
volume of air) be able to sound the whistle at the op
end by pushing down the piston and forcing the air
the whistle at the other end. The attention of both a
ants having been drawn by this means to the apparat
whistles may be closed by means of their stop-cock
the operations for making the visible signals comm
It will of course be understood, that at the station a
end of the air-pipe or tube there must be a complete
ratus, such as that shown in the drawing, and consis
indicating apparatus, air-cylinder, or syringe, a
appendages, so that audible or visible signals may b
from either end.

Fig. 3, is an elevation (some of the parts being sh
section) of a modification of the above, the differe
construction being confined to the indicating app
Instead of the trunk, *c*, and branch air-pipe commun
with a close chamber containing the indicating app
as in the former instance, the trunk is connected dire
one end of the bent flattened tube, *j*, *j*, which is cl
the opposite end, and is connected by means of
k, to a short lever, *l*, on the shaft, *m*, of the in
needle, *f*.

Upon drawing up the piston in the air-cylinder

bent tube, *j*, *j*, will be exhausted and collapse, and thereby push back the short lever, *l*, and cause the index to move towards the right; upon condensing the air in the bent tube, *j*, by pushing down the piston in the cylinder, *a*, the bent tube, *j*, will uncoil or tend to straighten itself, and will thereby draw the short lever, *l*, forward, and cause the index to move to the left; it will therefore be seen that, by alternately raising and lowering the pistons in the air-cylinder or syringe, the index, *f*, will be made to vibrate to and fro, and by these vibrations any signals or words may be communicated. On the dial is an alphabet whereby this may be effected. I would observe, that although, in order to avoid complication, I have shown a simple syringe and a piston actuated by hand, yet I sometimes propose, when the distance between the stations is long, to use a cylinder of much larger diameter and capacity, and to move the piston or piston-rod by means of a lever or by rack-work, in a somewhat similar manner to that now adapted to a compound or double-barrel air-pump.

Having now described my invention of improved telegraphic apparatus, and two plans which I have found by experience to act satisfactorily, I would observe, in conclusion, that I do not mean or intend to confine myself rigidly to the precise arrangement and construction of parts herein shown and described, as they may perhaps be varied without departing from the nature and object of my invention, nor do I intend to claim the exclusive right to actuate a needle or pointer by means of a fluid or liquid; but that which I consider to be new, and therefore wish to claim as the invention secured to me by letters patent as aforesaid, is, causing a needle or index-hand to move or vibrate on its centre by means of a column of air, alternately rarefied or compressed, or *vice versâ*, by a piston or other suitable contrivance, such column of air being made to act upon a thin flexible plate or diaphragm or collapsible tube, or other equivalent means, connected with the shaft or spindle of the said index-hand or needle.—In witness, &c.

JOSEPH ILSLEY.

Specification of a Patent granted to RICHARD ARCHIBALD BROOMAN, *of Fleet-street, in the City of London, for Improvements in the Manufacture of Paper.*—Dated June 10, 1853.—(Communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The said invention consists in manufacturing paper from wood reduced to small fibres or particles, which are obtained by some mechanical agent acting on the wood in the direction of the grain thereof and parallel therewith, the wood being held in every case so as to present the grain in the direction of its length to the reducing agent, and a current or stream of water being applied to the reducing agent just before contact with the wood or woody substance operated on.

The machinery preferred to be employed for the purpose of obtaining the fibres of wood and woody substances in manner aforesaid consists of a millstone or millstones, or metal rollers, cylinders, or rasps with roughened surfaces, which are caused to act upon blocks or pieces of wood held in a frame always in the direction of the grain thereof, as above mentioned, a current or stream of water as aforesaid being directed on to the stone or other reducing agent immediately before its contact with the wood. A gauge is provided to prevent the passage with the water of such portions of the wood or woody fibres as may not be sufficiently reduced. The fibres come from the stones, rollers, cylinders, or rasps in a state of pulp, and are passed through sieves of different gauges, from which they are taken to be applied to the manufacture of different qualities of paper. The pulp thus obtained may be mixed with rag-pulp, and with various other ingredients now employed in the manufacture of paper; and the pulp is to be submitted to the ordinary processes to which rag-pulp is subjected to form it into paper.

Fig. 1, of the drawings hereunto annexed, represents a vertical section; and

Fig. 2, a plan of a machine suitable for reducing wood and woody fibres to pulp for the manufacture of paper. The main part of this machine consists of a circular millstone or cylinder of steel, iron, or other metal, having a rough surface, and fixed in a vertical position on an axis or

shaft which revolves in suitable bearings. A, is the millstone, and B, the axis on which it is fixed, turning in bearings, C, which rest on beams or on a stone or iron foundation. The millstone turns in a box or casing, A^1, the under part of which is provided with an outlet, H, for the ground pulp. The millstone is driven by suitable power, and revolves in the direction indicated by the arrow. The speed at which it is driven is preferred to be from 180 to 240 revolutions per minute, when the millstone is about four feet in diameter. The upper part of the casing, A^1, enclosing the millstone has an aperture, in which is placed the frame, D, which is open at bottom, and the four extremities of which come nearly in contact with the millstone. At one side of this frame is formed a perforated compartment, E, which is intended to receive the water required to wet the millstone and mix with the fibre to form pulp, and on the other side of the frame and opposite to the compartment, E, is fixed within the frame an iron or steel gauge plate, G, which nearly touches the stone, and is intended to prevent any large particles of fibre which have not been sufficiently reduced from passing into the case, H. This gauge plate can be raised or lowered by hand or by tappets, or other suitable contrivances, according to the extent required, to suit the material operated on. The wood or woody substance to be reduced to pulp is placed with its fibres running in the same direction as that in which the millstone revolves, as before particularly directed, and as shown in the detached views, figs. 3, 4, and 5. This arrangement is absolutely essential, as upon it depends entirely the production of fibrous pulp suitable for the manufacture of paper. The wood is cut into suitable lengths, which are put into the frame, D, in the position described, and pressed down or held with the grain of the fibre parallel to the direction in which the stone rotates by a lever and weights, or by any other convenient means, on the grinding cylinder. The fibres when separated from the wood are carried away by the streams of water, and, passing downwards, pass through the case, H, into a vessel, I, which is furnished with a partition, K; and after having passed the partition, K, they flow gradually into a sieve, L, which by means of tappets, *z*, *z*, is jogged or shaken, in order to separate or divide the finer from the coarser particles of the pulp. The finer particles in the same way pass again into a sieve, M, where a second separation takes place, and proceeding

onwards they are allowed to flow under the sieve, N^1, which allows water to escape, and from whence the fine pulp is conveyed into the reservoir, N^2. The separation may be carried on to a greater extent as may be found requisite. The sieves are of different gauges, from coarse to fine, and they are shown in the drawing on a larger scale than the rest of the machinery for the purpose of indicating more clearly the proportionate size of the meshes. The different qualities of pulp thus obtained may be employed for the manufacture of paper of different qualities alone or mixed with any pulp of the sort ordinarily used, and with such other ingredients as are generally employed in manufacturing pulp into paper. The wood pulp may be bleached by any ordinary process, or by means of the following process, which I will now proceed to describe:—

According to this process the pulp is mixed, in the first place, with a solution of carbonate of soda or soda-ash, and subsequently with a solution of alum, the strength of these solutions being regulated by the degree of whiteness required to be given to the pulp. The relative proportions of the two chemical bodies in their respective solutions are as about two to one, that is, the quantity of carbonate of soda contained in its solution should be about double the quantity of alum contained in the solution of that salt. The total quantity of both required is about one-tenth by weight of the pulp operated on.

And having now described the nature of the said invention, and the manner in which the same may be performed, I declare that what I claim as the said invention is,—

First, the manufacture of paper from wood and woody fibres reduced to fibrous pulp by means of mechanical agents acting in the direction of the length or grain of the said fibres and parallel thereto, together with water or other suitable liquid applied in the manner hereinbefore described.

And, secondly, the particular arrangement of machinery represented in the drawing annexed, and hereinbefore described, for reducing wood to fibrous pulp suitable for the manufacture of paper.—In witness, &c.

RICHARD ARCHIBALD BROOMAN.

Specification of the Patent granted to WILLIAM JOSEPH THOMPSON, *of North Shields, in the County of Northumberland, Russian Vice-Consul, for Improvements in Heating Reverberatory and other Furnaces.*—Dated October 3, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of constructing furnaces in the following manner:—the bars (each of which consists of a flat plate) are placed parallel to each other, but so as to form an inclined grating; by this arrangement small coal can be burned without falling through between the bars. At the upper part of the grating there is a hopper, which is kept full of small coal; at the lower part of the grating there is formed or placed a box or chamber, into which the well-ignited fuel from the inclined grating falls, and into this box or chamber a quantity of atmospheric air is forced through several twyers or tubes, the oxygen of which combines with the highly heated carbon. Streams of air are also introduced at the bridge of the furnace, which may be heated by pipes or passages added to the furnace, or by separate apparatus, as is well understood.

And in order that the said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawing hereunto annexed:—

Fig. 1, is a longitudinal section; and

Fig. 2, is a plan in section of a reverberatory furnace, with the improved heating apparatus attached. A, is the hopper, into which the fuel is to be placed, and which is constantly to be kept full of fuel; B, are the inclined bars, which are to be placed at such an angle that the fuel will not at once roll to the bottom, but will gradually descend by its own gravity, as that below is consumed. C, is the box into which the ignited fuel descends, and into which air is forced by the twyers, D, which are supplied with air, either heated or otherwise, by the pipe, E. The products pass into the body of the furnace, F, and are there (to insure perfect combustion) brought in contact with another blast of air from the twyers, G, which air is heated by circulating in the passages, H, but it may be otherwise heated. At the two ends of the box, C, are doors, I, I, by which the ashes

are removed: as the other parts of the furnace are of the ordinary construction, no detailed description will be necessary.

Having thus described the nature of the invention, and the manner of performing the same, I would have it understood that I do not confine myself to the exact details described. But what I claim is, the peculiar arrangement of the bars, B, the box, C, and the twyers, D and G.—In witness, &c.

WILLIAM JOSEPH THOMPSON.

Specification of the Patent granted to CHRISTOPHER NICKELS, *of York-road, Lambeth, and* RALPH SELBY, *of York-road aforesaid, for Improvements in the Manufacture of Flexible Tubes and Bands, and in Covering Wire.*—Dated September 17, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Heretofore in the manufacture of flexible tubes and bands, and in covering wire with gutta percha, and matters requiring heat to keep them in a plastic state, the machinery has been so arranged as to require to be stopped from time to time for the purpose of re-charging the same with the matter or matters. Now the object of our invention is to combine rollers with machinery heated by steam or other convenient means, in order that the supply of the matter or matters may be constant. For this purpose, in place of employing a piston or forcer as heretofore, in a cylinder, to force forward the matter or matters (kept plastic by heat) to and through the die or dies, whether for making flexible tubes or bands, or for covering wire, a pair of rollers are applied, which are caused to rotate constantly in a direction to take in and to force the matter or matters to and through the die or dies, the die or dies apparatus and rollers being kept heated by steam or other suitable means, so as to retain the matter or matters plastic during the process.

Having thus described the nature of our invention, we will proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, shows a vertical section;

Fig. 2, a side elevation; and

Fig. 3, a front view of a machine, constructed according to our invention, suitable for the manufacture of flexible tubes; and

Fig. 4, shows a section and front view of the die separately. *a*, *a*, is the framing of the machine; *b*, b^1, are two rollers, the axes of which are supported by and turn in bearings at each end of the machine, and the roller, b^1, is capable of being moved towards and from the roller, *b*, by giving motion to the axis, *c*, on which are fixed the bevel pinions, c^1, c^1, which take into and drive the bevel-toothed wheels, b^2, b^2, fixed on the ends of the axis, b^3, b^3; the other ends of the axis, b^3, b^3, having a screw formed thereon, which takes into a female screw formed in the sliding pieces, b^4, and allows the bushes which support the axes of the roller, b^1, to move outwards by the pressure of the material passing between the rollers. The rollers, *b*, b^1, receive motion in the following manner:—*d*, is a pinion fixed on the axis, d^1, supported in bearings at each end of the machine; motion is communicated to the axis, d^1, by a strap over the pulley, d^2, from a steam-engine or other motive power, the pinion, *d*, takes into and drives the toothed wheel, *e*, fixed on the axis of the roller, *b*; the toothed wheel, *f*, fixed on the axis of the roller, *b*, taking into the toothed wheel, *g*, fixed on the axis of the roller, b^1, and gives motion thereto, in the direction of the arrows. *h*, is a chamber surrounded by steam spaces, h^2, fixed at each end to the framing, *a*, *a*. The undersides of the rollers, *b*, b^1, revolve in close contact with the hollow or curved surfaces, h^1, there being adjustable packings, h^3, h^3, regulated by set screws, as shown in the drawings; gutta percha, or its compounds, or other material, which is rendered and kept plastic by heat, and suitable for making flexible tubes or bands, or for covering wire, being placed on the upper surfaces of the rollers, *b*, b^1, will be conducted between the rollers by their rotation, and will be forced down through the channel formed by the parts, h^1, into the chamber, *h*, which is kept heated by steam, or it may be kept heated by other means, and thence through the die or moulding orifice, *i*, fixed to the front of the chamber, *h*. The moulding die or orifice is similar to those in common use for these purposes.

Fig. 5, is a vertical section of a machine suitably arranged for covering a series of wires with gutta percha or other material retained in a plastic state by heat; and

Fig. 6, is a section and front view of the die separately, and as the arrangement of this machine is similar to that previously described for making tubes and bands, with the exception of the die used, it will not be necessary to enter into a further description thereof, more particularly as the description above given applies equally to this machine, and the corresponding parts in the drawings are marked with the same letters of reference. We have not thought it necessary to show a die for a band, as it simply consists of an opening or passage of the form desired as heretofore, and it separately forms no part of our invention.

Having thus described the nature of our invention, and the manner of performing the same, we would have it understood that we are aware that it is not new to employ rollers to force plastic clay or matters kept plastic by fluids through moulding orifices or dies. We do not, therefore, claim the use of rollers for such purposes when uncombined with or used without means of rendering or retaining matters plastic by heat, and we would state that we do not confine ourselves to the precise details herein shown and described, so long as the peculiar character of our invention be retained.

But what we claim is, the combination or arrangement of rollers and parts herein described, for the manufacture of flexible tubes and bands, and for covering wire, when using gutta percha and its compounds, or other materials rendered plastic by heat.—In witness, &c.

CHRISTOPHER NICKELS.
RALPH SELBY.

Specification of the Patent granted to GEORGE SPENCER, *of Cannon-street West, Civil Engineer, for Improvements in Supporting Rails of Railways.* — Dated September 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of applying longitudinal bearers of

iron, which are corrugated transversely or across in such manner that the rails whether fixed directly to the bearers or indirectly are supported by the convex parts of the corrugations, and in some cases I combine therewith wood or other bearers below the corrugated longitudinal bearers of iron.

Having thus stated the nature of my said invention, I will proceed to describe the same.

Figs. 1, 2, and 3, show section, plan, and elevation. A, shows the rails resting on a series of wrought-iron corrugated plates, B, about two feet wide. The corrugations are about nine inches pitch, and the rail is secured to the corrugated plates by a half-inch bolt and nut, or rivet at each corrugation; a strip of felt, C, or any such-like material is placed between the rails and corrugated plates; a corrugated cross-plate, D, rivetted or bolted to the longitudinal plates, B, B, is placed about every fifteen feet to preserve the relative distances of the rails, and to assist in strengthening the rail-joints; E, is the ballast or roadway.

Figs. 4, 5, and 6, show section, plan, and elevation of another modification of my invention. A, is the rail resting on a series of corrugated plates, B, and bolted or screwed together at each corrugation, a piece of felt, C, being introduced between; the plates, B, are then bolted or screwed to the ordinary longitudinal sleepers, D; such, for example, as those used on the Great Western Railway of England; *d*, is a cross-timber every twelve or fifteen feet.

Figs. 7, 8, and 9, show another modification of my invention, in which the rail, A, is bolted or screwed to a longitudinal timber, D, which rests on and is bolted or screwed to a series of corrugated plates, B, resting on the ballast, E.

Figs. 10, 11, and 12, show another modification of my invention, in which the corrugated bearing-plates are of cast-iron. A, A, are the rails; B, B, are the cast-iron corrugated bearing-plates connected at every twelve or fifteen feet by a cross-plate, *b*, and bolted to the plate, B.

Various forms to which the bearing plates may be corrugated are shown in figs. 13, 14, 15, and 16, and a method of increasing the lateral strength by the use of double plates is shown in fig. 17. This latter plan can also be modified by placing the corrugations of the lower plates, N, longitudinally, that is, to say, at right angles with those of

the plates, B; but I prefer the method shown in figs. and 3. Any of these plates can be covered with any sui material to protect them from rust; but I prefer the vanizing process, or they may be used without.

Various sections of rails may be used, but I prefe section known as the bridge-rail, shown in figs. and 3, from its convenient form for securing to the be plates.

The pattern of rail, A, fig. 18, would perhaps do e well.

In fig. 19, I have shown another method of fixin rail, A; angle-irons, C, are rivetted or bolted to the b plates, B; the rail, A, is then held in position by the and keys, *e*.

Another method of fixing the rail is shown in fig 11, and 12.

The points in each case require especial attention.

In the mode figs. 1, 2, and 3, a bar of iron, d^1, fig introduced into the hollow space of the rail, which is at one end to one of the rails, as shown in fig. 3, dotted lines, the other rail being left to rest on it, allowing of expansion and contraction, and preventin evil of wide joints.

Figs. 9, and 10, 11, and 12, show efficient me forming a joint. The rail-joint and the flange, C, being made at different places, as shown in fig. 12.

First, I claim, the constructions herein describ wrought or cast-iron corrugated plates in lieu of sl for supporting the rails used on railways.

Secondly, the construction of corrugated iron-pla form a continuous spring, as described with refere figs. 4, 5, and 6.

Thirdly, the combination of corrugated plates and frames to form a continuous spring or bearing for th of railways.—In witness, &c.

GEORGE SPEN

Specification of the Patent granted to WILLIAM SMITH, *of Little Woolstone, in the County of Bucks, Farmer, for Improvements in Implements for Tilling and Preparing Land for Crops.*—Dated September 13, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of combining implements, such as I have before used as a subsoil plough into one. For this purpose a frame or body with handles similar to what has before been used is employed, on either side of which is applied another frame or body, but without handles, and the three are fixed by a transverse beam or framing. The fore-parts of the three frames or bodies are also combined by a second transverse beam or framing. Each of the three bodies or frames has a cutter similar to what has before been used for subsoiling, and its stem is capable of adjustment, and it has a draft-rod or chain passing through an eye above the framing or body. Each of the three frames or bodies has a wheel capable of adjustment. The three draft-rods or chains are connected to a bar by links in front, and this bar receives the whipple-tree. The bar has chains or links from it and passing through adjustable eyes below, near to the guiding handles, in order that the man may act on the bar in going about. Although I prefer three implements such as above described combined into one, other numbers may be used.

Having thus stated the nature of my invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a plan.

Fig. 2, a side view;

Fig. 3, a back view of a machine constructed according to my invention. *a*, *a*, *a*, are three implements such as have before been used by me for tilling land, and separately I do not now claim them as new, and I would state that the form of the point or part which cuts into the earth may be varied.

My present improvements consist of the manner of combining a series of such implements into one, and this is done in the following manner. The middle implement is the only one of the three which has handles, *b*, *b*, the

frames or bodies of the other two are however in all respects like the middle or central one; *c*, *c*, are two or transverse beams, which combine the bodies or f of the three implements, *a*, *a*, *a*, into one by mea screws, as shown, but this may be varied; and alt the body or frame of each implement is shown to be they may, if preferred, be double; *d*, *d*, *d*, are draft or rods fixed to the stems of cutting or tilling instru as shown, and the fore-part of each of these draft ch rods passes through an eye, *e*, fixed in the bar, *f*, connects the fore ends of the beams or bodies of the ments, *a*, *a*, *a*, as is shown; *g*, *g*, are two wheels, each of the outer two of the implements, *a*, *a*, and i cases in stiff land each of the implements, *a*, has its as shown, in the plan in fig. 1, by dotted lines; whipple-tree attached to the front bar, *f*, as shown, a are chains for inclining the whipple-tree to one or side, and the chains are hooked up accordingly at *j*, *j*

Having thus described the nature of my inventio the manner of performing the same, I would have it stood that I do not confine myself to the details shown and described, as other numbers of implemen be combined.

But what I claim is, the combination of seve plements, *a*, into one machine or implement, as described.—In witness, &c.

WILLIAM SM

Specification of a Patent granted to JOHN MACINTO *Pall Mall East, in the County of Middlesex, Engineer, for Improvements in the Construction of B Boats or Vessels and Buoys.*—Dated June 15, 185

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. This invention consists in constructing boats, hollow and buoys, of waterproof fabric, and in giving form when required for use by means of ribs of wood e thus in forming a boat several of such ribs are use are of a length to run from stem to stern and bein attached together they will in their ordinary state be and with the waterproof fabric lie and pack close, b

the two ends of each rib are drawn towards each other by a screw or other means each rib will bend into the form of a bow and by so doing will give the desired shape to the boat, and such is the case in respect to a buoy or like form of vessel intended to float in the water.

Having thus stated the nature of my said invention I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, shows a plan of a boat or vessel made or constructed according to my invention.

Fig. 2, shows a side view of the same.

Fig. 3, shows a plan of the boat or vessel when in the expanded state for use, and,

Fig. 4, shows a longitudinal section. In each of these figures the same letters indicate similar parts. *a*, *b*, are two ribs forming the gunwales of the boat or vessel, and *c* is another rib to which the false keel, *d*, is fixed. These ribs when the boat or vessel is not required for use, lie together parallel to each other and occupy little space. The ribs are connected by means of a strong waterproof fabric, *e*, *e*, which when the boat or vessel is not required for use folds into and occupies only a small space, as shown in figs. 1 and 2, and it is desirable that the waterproof fabric should be creased or folded so as to have a tendency to shut up at all times in the same form or folds. The boat or vessel is expanded by means of the seats or "thwarts," *f*, *g*, *h*. The middle seat or thwart, *g*, has screws to expand it longitudinally, as shown, after it has been introduced into its place between the two ribs, *a*, *b*, but this is not absolutely necessary, as the opening out of the boat or vessel by a man or men on both sides, according to the size and strength of the boat or vessel, will offer sufficient power to expand the boat or vessel. The rib, *c*, is expanded or curved by means of the screw, *i*, acting under the seat, *g*, and in the screw socket, *j*, as shown.

I would state that although I have shown a boat or vessel to consist of only three ribs, more may be used, and also more seats may be introduced, all which will depend on the size and strength of the boat or vessel desired to be constructed according to my invention. In constructing buoys according to my invention the same are made with ribs in like manner, combined with waterproof fabric, but the same is enclosed on all sides in the manner of a flexible

globe; the upper and lower ends of the ribs are conne with a disc at top and bottom, and a screw is passed thr the centre of the upper disc and is connected with lower disc, so that by turning the screw the lower an upper disc are drawn towards each other, by which the are bent and the apparatus expanded into a globul other form according to the arrangement of the parts.

Having thus described the nature of my said inve and the manner of performing the same, I would h understood that what I claim is the mode herein des of combining parts into boats or other vessels and bu In witness, &c.

JOHN MACINTO

Specification of the Patent granted to ERNEST ALEXA GOUIN, *of* 110, *Avenue de Clichy Batignolles, Par the Department de la Seine, France, for Improveme Looms, or Weaving Machines Applicable to the We of Cotton, Silk, Flax, Hemp, Wool, or any other F Substances, by means of which Improvements the Threads are unwound more regularly from the Roller and the cloth or tissue taken up with more regu at the same time without straining the Warp Threa by means of a peculiar motion in releasing the t on the Warp Thread he is enabled to give an l or back motion to the Warp which permits of all in fibrous substances to be woven upon the Power Loom in case the Weft Thread should break, the Loo continue in motion without the Cloth Roller cont to take up or without detriment to the tissue.*— September 9, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., My improvements in looms consist,

First, in the employment of a mechanical arrange the break on the warp roller: by which means the ten the warp threads or the resistance to its unwinding r constant whatever may be the diameter of the rol which it is unwound; so that the loom may be regul such a manner that a given tension or strain on th threads being necessary to produce the unwinding wh

warp roll is full, this strain will remain constant whatever may be the diameter of the roll of warp thread, that is to say, the resistance to turning on the circumference of the break pulley diminishes in the exact ratio of the diminution of the diameter of the roll of warp threads.

Secondly, in the disposition of the taking-up motion: by which means the force exerted on the tissue or the circumference of the taking-up roll (when once adjusted to the required degree) will remain constant, without it being necessary for the weaver, or person in attendance on the looms, to either change or readjust the taking-up force whatever may be the diameter of the roll acted upon.

Thirdly, in the taking-up motion admitting of exactly the same amount of advance of the tissue each stroke of the log beam, that is to say, the speed of the circumference of the taking-up roll will remain constant whatever may be the diameter.

Fourthly, in allowing the tissue woven to give back or unroll a small quantity at each stroke of the log beam, so as to relieve the strain on the warp threads when the heddles open or separate the threads for the passage of the shuttle, or, in fact, to relieve the warp threads at any desirable moment for improving and facilitating the action of weaving.

Fifthly, in the construction and use of an eccentric by which the backward and forward motion of the taking-up lever is produced, so that the motion of the taking-up roller relative to the motion of the log beam may be varied in any degree to suit the exigence of the work or tissue to be produced.

Figs. 1, 2, 3, and 4, represent my improvement in the manner of producing an equal resistance to the unwinding of the warp threads, which is done by gradually decreasing the weight or tension on the break pulley of the warp roller. In figs. 1 and 2, A, A, is a lever having its fulcrum at B, and between the other end, E, and the surface of the roll of warp threads, is interposed a spring, F, which presses down the lever and consequently throws the requisite strain on the cord, strap, or other substance which composes the break, which bears on the surface of the pulley, G, it is evident that as the roll of warp diminishes in diameter the distance between the surface and the end of the lever, E, will be increased and the compression of the spring will be decreased; thus decreasing the tension on the break

so that the resistance on the circumference of the pulley, G, may be diminished in the exact ratio of the decrease of the diameter of the roll of warp.

Figs. 3, and 4, represent another combination to produce the same result, where, A, A, is the lever to produce pressure on the break through the medium of the springs, F, F. which springs are gradually relieved as the roll of warp diminishes. These springs are made of steel or other suitable material.

Fig. 5, is the representation of the eccentric employed on the end of the crank shaft to give motion to the double lever, H, H, figs. 1, 2, 6, and 7. At the point, I, is the centre of the pin, I, I, revolving freely in its bearings in the double lever; upon the end of this pin, I, a crank arm, J, J, is keyed. the end of which is made to bear on the surface of the roll of tissue; upon the same pin, I, is also fixed the arm, K, K, the other end of which works in the groove or slot of the lever, L, L, the upper part of which lever is furnished with a number of drivers which act upon the ratchet wheel, M, M, which is fixed on the shaft of the taking-up roller. On the same pin, I, I, but revolving freely on it. is the arm, N, the other end of which works in the groove or slot of the lever, O, O, which is exactly similar to the lever, L, L, but which acts on the other side of the ratchet wheel, M, M. At the point, P, is the axis of a small pulley to guide the chain which unites the arm, K, with the arm, N, so that when the end of the arm, K, which works in the slot is depressed by the action of the increase in diameter of the taking-up roll, the arm, K, will be depressed in a greater degree, that is in the ratio of the distance of the points of attachment of the connecting chains from the centre of the axis, I. Q, is a spring which can be adjusted to the required force. Now it is evident that as the crank shaft revolves, the lever, H, H, will be depressed, and the spring, Q, will be extended and *vice versâ*, the lever, H, H, will rise by the force of the spring, thus producing a backward and forward motion to the pin, I, which communicates its motion to the levers which act on the ratchet wheel, but as the angular motion of the levers, O, and L, will be different according as the arms, K, K, and N, are at different distances from the centre of the taking-up roll, it is evident that the action on one side of the ratchet wheel will be more than the other, consequently there will

a backward and forward motion transmitted to the taking ratchet, at the same time the tissue will be advanced efinite distance at each stroke of the log beam.

ig. 7, represents a modification in the form of the lever, hich is useful to weave very open tissues, and where a tive motion may be necessary, instead of the combined on of the eccentric and the spring, it is evident that the e rolling and unrolling motion will be transmitted to roll of tissue by the eccentric alone, but without the ic action or the spring.

weaving certain tissues, the action of the reed in the eam pushing up the weft-thread (which is thrown s by the shuttle) determines the unwinding of the -thread from the roller; and the slackness of the tissue produced in front of the reed allows the spring, Q, to and to roll up the tissue; but when the weft-thread ks, or is not thrown across, and the reed does not unter the weft-thread, there is little or no force pro- d by the action of the reed to unwind the warp-thread, the action of the spring, Q, not being sufficient in itself th roll up the tissue and unwind the warp-thread, the e and warp-thread remain stationary, although the may continue in motion indefinitely, in fact, the taking- notion ceases to act.

gs. 8 and 9 represent another modification of the g-up motion. A backward and forward motion is to the lever, R, in the same or similar manner as is to the levers, L and O: but instead of the ratchet- l, M, a worm-wheel, S, is used; the superior part of the , R, carries a worm-shaft, in the end of which is a et-wheel, T, and a moveable arm, U, and driver, V; the of the arm, U, is made to encounter either a stud or ned plane fixed to the framing of the loom. Now it is ent that the motion given to the lever, R, will have a ency to make the end of the moveable arm, U, descend; as it encounters the stud or piece of the framing, X, it push the driver or cliquet, and by this means give ion to the worm-wheel which winds on the tissue to the r.—In witness, &c.

ERNEST ALEXANDRE GOUIN.

Specification of the Patent granted to MOSES POOLE, *of the Avenue-road, Regent's-park, in the County of Middlesex, for Improvements in Apparatus and Means for Removing Matters or Heat from Currents of Air, Gases, or Vapours, or from Liquids, and for communicating Matters or Heat to the same.*—Dated September 13, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists in removing foreign matters and heat from, and communicating foreign matters and heat to, currents of air, gases, and vapours, and liquids, by means of sheets of cloth, or wire-cloth, or wires, or other similar fibrous or porous material, through the interstices of which currents of air, gases, or vapours, or liquids, can easily pass; the same being kept constantly wet or washed, or heated or cooled, by any suitable means, such as the revolution of the sheets of cloth, or other porous material, while partly immersed in a reservoir or vessel containing water or other hot or cold liquid, the currents of air, &c., passing through the portion of the revolving sheets of cloth or other material which is not immersed.

Having thus described the nature of the invention, I will proceed to specify a good mode of putting it into operation, reference being had to the accompanying drawing.

Suppose it be desired to remove from a current of air dust, smoke, cinders, or other similar foreign matters and heat, so that the current of air shall be both purified and cooled, I use the following described apparatus, of which (see drawing) fig. 1 is a vertical longitudinal section, and fig. 2 a vertical transverse section, the same letters referring to the same parts in both figures. Let A, A, be a square pipe in which the current of air is flowing in the direction of the arrow; B, B, is an endless sheet of, say, cotton or linen cloth of open texture passing over the rollers, C, C, supported at the ends, which keep the cloth distended. The cloth is so arranged as to totally intercept the current of air. By means of a pulley, D, or other convenient machinery, at the end of one of the rollers, it is made to revolve by any kind of power, and its revolution causes the cloth to revolve upon the rollers. E, is a reservoir of cool water placed underneath the pipe, A, and the lower part of the cloth, B, is immersed in the water in the reservoir. It is evident

that the cloth, B, revolving upon the rollers, will be kept constantly wet and washed and cooled; and intercepting the current of air in the pipe, will remove from it dust, smoke, cinders, &c., and heat; and the removal of heat will be aided by the evaporation of the water from the cloth, and moisture will be communicated to the current of air. The foreign matters removed from the current of air will adhere to the wet cloth, and be carried down and washed off into the reservoir; and it is expedient to make the reservoir somewhat deeper than the lower roller, to allow room for the deposit and accumulation of the impurities removed from the current at the bottom of the reservoir.

Or, instead of the endless cloth above described, I sometimes use another similar apparatus, of which fig. 3 represents a longitudinal and fig. 4 a transverse section. B, B, is a cylindrical mass of, say, wire-cloth arranged on an axis supported at the ends, and placed longitudinally in and between a semi-cylindrical pipe, A, A, and a reservoir of water below, E, care being taken that the whole current of air in the pipe is intercepted by the cylindrical mass. It is evident that the cylindrical mass being made to revolve upon its axis by means of the pulley, D, or otherwise, the impurities and heat will be removed from the current and deposited in the reservoir, E, by the revolving mass, B, B. Thus, by means of this apparatus, apartments in railway or other carriages, ships' cabins, &c., may be supplied with pure and cool air. When applied to carriages, the power required to cause the revolution of the cylindrical mass may be derived from the wheels or axles, and conveyed by a band or shaft to the apparatus placed on the top of the carriage, or the power may be derived from a small windmill on the carriage.

It is manifest that as currents of air may be thus purified or cooled, so currents of gas or vapour of any kind may be purified or cooled, and by using instead of water in the reservoir, E, a liquid having a chemical affinity for the gas or vapour, or any component part of the gas or vapour, chemical effects may be produced either by removal or communication. Thus odours may be removed, or perfumes or medicated vapours may be communicated to currents of air, &c. Thus ammoniacal gas which has a strong affinity for water, may be removed from a current of coal gas, and communicated to the water in the reservoir. By the same apparatus, naphtha or other liquid, rich in

carbon, being placed in the reservoir, a current of gas
be supplied with carbon. By the same apparatus, sy
may be deprived of an excess of watery matter, and
be cooled, and the process may be aided by a blast or st
artificial current of air passing through the pipe.
evident that if the liquid in the reservoir be hotter tha
current passing through the pipe, heat will be comm
cated to the current; and thus by means of hot
placed and renewed in the reservoir, warm, clean and
currents of air may be introduced into apartments,
means of melted metal in the reservoir, a dry heat m
imparted to the currents, &c.; and if the current of
hotter than the liquid in the reservoir, the liquid will d
heat from the current. The revolving cloth (or cylin
mass) may be made a little larger than the pipe conv
the current, the outer edge and top of the cloth ente
recess in the pipe as shown at F, fig. 1, and so the wh
the current will pass through the cloth.

I do not confine myself to the particular ter
apparatus or means of working it herein described.
form and means may be varied indefinitely. Thus, in
of wire cloth, sheets of perforated metal may be used
thin plates of metal placed close together, or a cylin
mass may be placed transversely in the pipe, or the
or wire-cloth may be washed by a shower or jet falling
it,—or instead of revolution, a reciprocating vertical
ment may be substituted, several masses of porous ma
being simultaneously used, and one of them always be
the current so as to intercept it.

Having thus described the nature of this invention
the mode of putting it into operation, what is claimed

First, the removal of foreign matters or heat from
the communication of foreign matters or heat to, curre
air, gases, or vapours, or liquids, by means of she
masses of porous material, kept constantly wet or w
or heated, or cooled, and intercepting the current, or p
through the liquid, substantially as herein described.

Second, the use of the apparatus and means
described, for the purposes herein mentioned, substa
as herein described.—In witness, &c.

Moses Poo

Specification of the Patent granted to GEORGE KENNEDY GEYELIN, *of Camden Town, in the County of Middlesex, for Improvements in the Manufacture of White Oxide of Zinc.*—Dated April 26, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improvements relate, first to the novel form of retort used in the process of sublimation of zinc, for the purpose of obtaining the white oxide:

Secondly, the invention relates to the arrangement of retorts used in the production of the white oxide of zinc:

Thirdly, the invention relates to admitting jets of steam or vapours into the retorts, to facilitate the oxidation: And,

Fourthly, the invention relates to means for supplying the fuel to furnaces used when producing the white oxide of zinc.

But that the nature of the invention, and the means of carrying the same into effect, may be fully understood, I will proceed to explain the means pursued by me.

Description of the Drawing.

Fig. 1, shows a perspective view of a retort, arranged according to the first part of the invention, which consists in forming them shallow, (that is, from *a*, to *b*,) in proportion to their width, (or from *c*, to *d*,) say in depth (from *a*, to *b*,) about one half their breadth, (from *c*, to *d*,) or less, and with flat or comparatively flat bottoms, the object being to expose a large surface of metal in the retort to the direct action of the heat, and thus to accelerate sublimation, and prevent as much as possible, large quantities of residue.

Figs. 2, 3, and 4, show a longitudinal section, a transverse section, and a sectional plan of a series of such retorts, set according to the second part of the invention. In these figures, *e*, *e*, are the retorts; and although I have shown only four, other numbers in the series may be employed; and they are placed in contact, so that the heat and products of combustion from the fire-place, *f*, cannot pass up between the retorts, but must pass first along their under surface, and then over their upper surface, thence away by the flue, *g*. In place, however, of only one series

of retorts in contact being used, forming one shelf, under and over which the flame and heated particles pass, there may be several such shelves of retorts, so arranged that the flame and heated particles may play under and over them. Or the retorts may be so arranged that the flame and heated particles may first play on the upper surface thereof, and then upon the under surface. *h*, is a pipe, one to each retort, for the purpose of admitting steam or vapour thereto, according to the third part of the invention. If the vapour of water be used, the heat of the furnace will cause a decomposition of the particles of water; and the hydrogen being separated therefrom will increase the flame, while the oxygen will combine with the vapour of zinc to facilitate the formation of the white oxide. I do not, however, confine myself to the use of the steam or vapour of water, as the vapour of other matters, as the oxide of manganese or barytes, which, when heated, freely give off oxygen, may be employed. The retorts are set with their open end, e^1, opening each to a chamber, *k*, where the oxide of zinc is condensed and collected by means of funnels either of canvas, iron, or other material. In arranging the furnace for heating the retorts used in the manufacture of the white oxide of zinc, it is important that the fire should be checked as little as possible by the feeding of fresh cold fuel; and the fourth part of my invention consists in forming furnaces used in the manufacture of the white oxide of zinc with a charge chamber, *i*, to receive the next charge of fuel to the furnace, and which charge, by resting upon the sliding plate, i^1, becomes heated; and, when required, the charge is allowed to fall into the fire-place by withdrawing the sliding plate, i^1. *j*, are the furnace bars.

Having thus described the nature of my said invention, and the best means I am acquainted with for carrying the same into effect, I would have it understood that I do not confine myself to the precise arrangements shown and described, so long as the peculiar character of any part of the invention be retained.—In witness, &c.

GEORGE KENNEDY GEYELIN.

Specification of the Patent granted to JAMES BRISTOW, *of Bouverie-street, in the City of London, Miller, and* HENRY ATTWOOD, *of Holland-street, Blackfriars-road, in the County of Surrey, Engineer, for Improvements in the Means of Consuming Smoke.*—Dated April 29, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our invention relates to a mode of constructing or arranging the flues of steam-boiler and other furnaces, when two or more are set side by side, or brought into connexion with each other, so that the smoke or gases of combustion given off from one furnace may be conducted over the bright fire of another furnace, and be thereby consumed. This object we effect by bringing the several adjacent furnaces into communication with a common flue, provided with dampers, which will permit of a temporary connexion being set up between any two furnaces in the range. Thus, when fresh fuel is thrown on to one of the furnace fires, by diverting the course of the gases generated in that furnace, and causing them to enter the common flue (which diversion may be effected by closing the damper in the exit flue of the smoking furnace) the smoke and gases may be conducted into a furnace having a bright fire, and be there consumed. When smoke ceases to be given off from the recently-charged fireplace, we then turn the gases of combustion into their proper channel, and allow them to escape into the chimney.

In the accompanying drawing,

Fig. 1, shows in front elevation,

Fig. 2, in sectional elevation, and

Fig. 3, in sectional plan, the manner of connecting together a series of steam-boiler furnaces according to our invention. *a*, *a*, are the boilers, which are severally set in brickwork, which forms a flue, *b*, around them of the ordinary kind. Into this flue the flame and heated gases from the fireplace, *c*, pass by a flue, *d*, which runs under the boiler, and the gases having circulated through the flue, *b*, escape into a common flue, *e*, at the back of the furnaces, and finally make their exit at the chimney, *f*. Immediately over the fireplace, *c*, in each furnace, is an opening which leads to a flue, *g*, formed in the brickwork, and running from end to end of the series of furnaces.

These several openings are commanded by a slidin
or damper, *h*, which, when closed, cuts off the comm
tion between the several furnaces and the flue, *g*.
flues, *b*, near that end which connects with the c
flue, *e*, at the back of the furnaces, are likewise se
provided with a damper, *i*, for cutting off the comm
tion between their respective furnaces and the f
These dampers, *i*, are each suspended by a chain, *k*,
passes over carrier pulleys, and is thereby brought
front of the furnace, to enable the attendant to rai
lower the dampers with facility.

Supposing, now, a bright fire to be burning in the f
No. 1, and a fresh charge of coals to be required
furnace No. 2, the attendant will, prior to throwing
coals, close the damper, *i*, of the latter furnace, and
the damper, *h*, of both furnaces, whereby the smoke
from the fresh charge will be diverted from its usual
towards the chimney, and thrown back to the front
furnace. A communication being now established b
the furnaces Nos. 1 and 2, the smoke will pass fr
latter into the fireplace, *c*, of the former, which conta
have said, a bright fire, and it will be there con
When smoke is no longer given off by the fire in the f
No. 2, the damper, *i*, of that furnace is to be opene
supposing the fire to be now burning brightly in this fu
and a fresh supply of coals to be required for furnace
the damper, *i*, of the latter furnace is to be closed,
communication established (in like manner to tha
described) between the furnaces Nos. 2 and 3; the d
h, of furnace No. 1 being closed to cut off the com
between that furnace and the common flue, *g*.

It will thus be understood, that any two furnac
series can be connected together at pleasure, f
purpose of diverting the smoke generated in one furn
to the bed of bright coals in an adjacent furnac
thereby effecting the combustion of the smoke. Ins
employing a flue built up in the brickwork, for prod
passage of communication between the fireplaces of
furnaces, iron or other tubing, having short branch
leading to the several furnaces, may with advantage b
especially when the Invention is required to be app
furnaces already constructed.

Having now described our Invention of Improvem
the Means of Consuming Smoke, we wish it to be

stood that we lay no claim to the broad principle of diverting the smoke and heated gases generated in one furnace, and passing them under or over the bright fire in an adjacent furnace; but what we desire to secure under the above in part recited letters patent is, the means hereinbefore described, by which any two of a series of furnaces may be readily brought into connexion with each other, for the purpose of effecting the combustion of the smoke given off from the successive charges of coal supplied to such furnaces.—In witness, &c.

JAMES BRISTOW, JUN.
HENRY ATTWOOD.

Specification of the Patent granted to WESTON GRIMSHAW, *of Mossley, County Antrim, Ireland, and* ELLIS ROWLAND, *of the same place, for Improvements in the Manufacture of Bricks.*—Dated Sept. 7, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The object of this invention is to make bricks of dry clay by its compression in a mould. The improvements consist,

1st, In the use of a piston in a steam cylinder acting in a direct manner on a pallet or die which forms the bottom of the said mould.

2dly, In the use of blocks or pins in combination with such piston, for the formation of perforated or indented bricks.

Having thus described the nature of our invention, in order that it may be more fully understood, we now proceed to describe the means pursued by us. The same letters and numbers refer to the same parts in all the figures. *a*, *a*, *a*, the frame of the machine; *b*, the steam cylinder; *c*, the piston; c^1, the piston rod, or ram; *d*, the die for making solid bricks; *e*, e^1, bricks; *f*, the plate containing the moulds of the bricks, or other articles to be made; *g*, table by which motion is given to the machine; *h*, stud on which the table, *g*, and plate, *f*, revolve; *i*, i^1, catches which take into notches, *k*, *l*, *m*, &c., in the plate, *f*, one of which causes it to move in the direction from *m* to *l*, and the other prevents it returning when the motion of the plate, *g*, is reversed, as will be explained; *n*, *o*, nogs for moving the

valves for giving steam to and exhausting it fro
cylinder. *b*; *p*, p^1, catches on the top of the valv
which work on hinges, and so allow the nogs to pass
direction, without lifting-rods; *q*, q^1, steam and e
passages; *r*, plate to which are attached the pins or
for forming perforated or indented bricks, pipes, o
articles; *s*, a plate receiving the impulse of the ram,
connected with the pallet, *t*, by means of the rods, *u*,
v, *v*, *v*, pins, which are fastened to the plate, *r*, for m
perforated brick; *x*, hopper for containing the dried
material of which the article is to be made.

It will be perceived, that on giving a recipr
motion to the table, *g*, by means of a crank, or in an
way that may be desired, it will carry along with
plate, *f*, by means of the catch, *i*, until the mould,
fig. 2, arrives at the place now occupied by No. 1,
said mould, No. 2, having previously passed un
hopper, *x*, fig. 1, will be filled with the material
pressed; and that the said plate, *f*, is prevented re
by the catch, i^1, which is attached to the frame,
which will consequently fall into the notch, *l*, on its
at the place now occupied by the notch, *k*. On the
of the said table, *g*, the nogs, *o*, will lift the rod of th
which admits them to the cylinder by the pipe, q^1,
pressure will be given to the brick, after which the
continues its progress till the nogs, *n*, *n*, lift the ro
valve which opens the cylinder to the exhaust-pipe
the piston, *c*, will fall to the bottom of the cylinde
own weight, and this being repeated the same act
keep going on. For making perforated or indented
the pins or blocks are firmly attached to the plate
pass into the mould in the plate, *f*, through the pi
which it is connected, by means of strong pins or
a plate which receives the impulse of the piston-rod
e. For more conveniently removing the bricks, it
perceived that the bottom of the die, *d*, and the pla
being carried round with the plate, *f*, will come in
with the inclined plane, 5, shown in figs. 3 and 5,
raised till the brick will be in the position shown at
the studs attached to the sides of the dies, *d*, and p
shown in fig. 3, Nos. 3, 3, and 4, 4, will then pass un
the flanges of the inclined plane, 7, and shown in
No. 6, fig. 3, and will be drawn down into their
position.

We claim for making bricks by the pressure of a piston in a steam cylinder acting directly on the dies or pallets forming the bottom of the moulds; and secondly, combined therewith the method above described of making perforated or indented bricks.—In witness, &c.

WESTON GRIMSHAW.
ELLIS ROWLAND.

Specification of the Patent granted to GEORGE DEARDS, *of Harlow, in the County of Essex, for Improvements in Lamps.*—Dated August 11, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object the application of spirit vapour lamps to railway trains, and other uses where the lamps are required to be moved through the air quickly, to which purposes these lamps have been heretofore inapplicable. And the improvements consist of causing the wick of such a lamp to be enclosed in a tube, which is perforated at its lower end, such tube descending into the vessel containing the spirit, and in order to prevent the strong currents of air or the spirit coming against the upper part of the tube where the vapour is generated, and near where the vapour is ignited, the tube passes through a closed chamber, the lower part of which covers the opening into the spirit vessel, and in order to prevent currents of air getting to the flame a double cap or cover is employed, perforated with holes, by which the heat of the cover is carried off, and at the same time numerous small outlet holes from the interior of the lamps (which are perforated outwards) convey the products from the lamp into the double casing; the larger holes in the outer casing allowing currents of atmospheric air to enter and pass away.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, shows a front view in section of a lamp suitably formed for being fixed at the back of a railway train.

Fig. 2, is a transverse section of the same; and I would

state that the form of the lamp may be varied according to the purpose to which it is to be applied, my improvements only applying to the parts surrounding the wick, and the means of preventing violent currents of air consequent on high velocity acting within the lamp. *a*, is the vessel which contains the supply of spirit; it is cylindrical, but it may be of any other form; *b*, is a tube, with a screw cover, b^1, through which the supply of spirit is poured into the vessel, *a*; *d*, is the wick which supplied spirit from the vessel, *a*, up to the interior of the burner tube, c^2, where the spirit is vaporized by the heat of that tube; c^1, is a cup to contain a small quantity of spirit when it is desired to heat and light the burner. The burner tube, c^2, passes through the screw cap, c^3, and such cap is fixed by screwing to the part, c^4, there being washers of leather or other suitable flexible material, c^5, retained between them and the burner tube, c^2, is held securely thereby, as shown in the drawings.

I would remark that the burner, *c*, and the parts above described are not of my invention, but are such as are made and sold by Mr. Read Holliday, of Huddersfield.

e, is a tube which is closed at bottom, and has numerous small holes therein near the lower part, and this tube is such as to allow of the fibres or strands of which the wick is composed being more open and loose than where the wick is more compressed in the burner tube, c^2, which burner tube, c^2, descends partly into the upper end of the tube, *e*, but not into the spirit. The upper part of the tube, *e*, where it is above the vessel, *a*, is enclosed by an outer cylinder, *f*, which is closed at top so that there is a space or chamber within the cylinder, *f*, by which the atmospheric air which comes freely in contact with the cylinder, *f*, and with considerable force when the lamp is being moved with high velocity through the air, is prevented coming in contact with or cooling down that part of the apparatus or burner tube, or the outer tube, *e*, where the spirit is heated and vaporized. And it will be found that by constructing and combining the parts, *e* and *f*, in the manner above described, the spirit will not only be stopped from splashing against the parts of the apparatus where the vaporization of the spirit takes place, but those parts will be protected from the cooling effects of strong currents of air. The vessel, *a*, is placed within the lower part, *g*, of the case of the lamp, in which there are several

g, *h*, *h*, for the passage of air into this lower compartment, and the air rises from such compartment, *g*, into the chamber of the lamp, where the burner, *c*, is fixed, the air passing through the holes, *i*, *i*. This part of the lamp is similar to like railway lamps where oil burners are employed; *j*, is the glass, and *k*, the reflector. The upper part of the lamp is formed double in such manner that the heated air and products from the burner may pass away, and yet that the holes through the upper part of the lamp shall not produce currents of air such as would blow out or injuriously flicker the flame of the burner; *l*, is a cylinder closed at top and perforated near the upper part with numerous holes. The cylinder, *b*, is fixed in the partitions, *m* and *n*. The partition, *m*, is perforated with numerous small holes, but the partition, *n*, is unperforated. The space between the partitions, *m* and *n*, is freely open to the exterior atmosphere by reason of the holes, *p*, *p*, which are made all round the lamp, and the air which enters such space by the holes, *p*, can pass freely into the interior of the lamp above the burner by reason of the numerous small holes in the partition, *m*. The cylinder, *l*, is enclosed by the outer casing, *q*, in the sides of which casing are holes, q^1. The outer casing is closed at top, and has holes, (at the upper part,) at the back, front, and sides. By these arrangements, at the upper part of the lamp, combined with the apparatus above described, I find lamps burning vaporized spirit may without prejudice to the flame be moved through the air at very high velocities, and thus are such descriptions of lamps, I believe for the first time, made applicable to railway and other uses where lamps require to be moved quickly through the air.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that although I have been particular in showing the lamp exactly as constructed by me, I do not confine myself to the precise details, or the forms of the several parts, so long as the peculiar character of my invention be retained. But what I claim is, the combination of apparatus herein described.—In witness, &c.

GEORGE DEARDS.

Specification of the Patent granted to EUGENE DE
of Great Chesterfield-street, in the County of M
Artist, for Certain Means of Depriving Caoutcho
Unpleasant Odour, and of Imparting to it variou
able Perfumes.—Dated August 26, 1853.

To all to whom these presents shall come, &c
The invention consists of three distinct methods
cesses.

The first consists in exposing caoutchouc or
coated with caoutchouc in baths containing in solu
fusions, essences, decoctions, extracts, &c., of such v
matters as flowers, plants, and roots.

The second process consists in subjecting caoutc
articles coated with caoutchouc, to the action of
of air or vapors.

The third process consists in immersing the cao
or articles coated with caoutchouc, in baths containi
tions of lime. For some purposes I use two of
cesses combined, and for others I combine othe
with one or more of them, as hereinafter describe
respective methods of operation are as follows:—

Solution No. 1.

In twenty-four quarts of water I place 4 lbs.
verbena, which should be chopped up so as to expo
process of maceration, which is to be performed i
state in a large covered vessel adapted for such
This infusion takes from twenty-four to thirty-six
attain a suitable strength. I take four quarts of t
sion of verbena, in which, during the space of an
the most, ½ lb. of dry flowers of lavender are boil
this the remaining twenty quarts are added, and
ture is transferred to a filter in order to cleanse
residuary matters. It is then poured into a wide
or other suitable vat capacious enough to allow
coats, paletots, fabrics, &c. coated with or waterp
caoutchouc to be disinfected, being spread out fla
whereby the action of the solution will be expedit
paletots, fabrics, &c., are then immersed in the
tion, care being taken to turn them over several
order to facilitate the penetration and action of the

They are left in the bath for a time depending on the thickness of the article under treatment. Paletots, leggings, air cushions, or other articles of a similar character, require from twenty to twenty-four, and even as much as twenty-six hours. When such time has elapsed the articles are withdrawn and spread out on ropes to dry. This latter process, when performed in the fresh air, varies according to the temperature and season. I have found by experience, however, that it is preferable to dry the articles or goods in a drying apparatus, or better still in a drying stove, whereby the desiccation only occupies a very few hours; the success of the process depends considerably on the rapid drying of the goods. The action of the drying chamber or stove, while drying the goods at the same time, reduces the degree of expansion they acquire under the action of the disinfecting agents. It is a good plan to stretch out the goods on cords in the fresh air for about an hour, but no longer, after they have been removed from the drying chamber. When this last operation has been completed the goods are ready for use, and they will be found to be entirely free from any return of the odour of caoutchouc or of any of the substances employed in the manufacture of waterproofed materials, even when the goods have been vulcanized. The first solution is adapted to all sorts of light goods, such as alpaca overcoats, coloured silks, air cushions, kerseymeres, cashmeres, velvets, and other descriptions of fabrics. The lavender flowers may be replaced by from two to three ounces of the root of the whorl-flowered bent-grass (vetyver), which has the property of easily dissipating the odour of caoutchouc. This root is to be infused in about four quarts of solution of verbena, which is to be heated, but not boiled. When the root has been allowed to remain ten or fifteen hours in the solution, and the solution has cooled, it will have acquired the necessary amount of action. The whole should be mixed up as previously described, care being taken to filter it; care should also be taken to keep up the requisite quantity in the bath; and it should be renewed from time to time by adding fresh supplies of solution in the same proportion as before. After the infusions have been completed, the residua of the verbena, the lavender, and especially the root of the whorl-flowered bent-grass (vetyver) may be turned to account by placing them together in an earthen vessel or barrel filled with water. They yield by macera-

tion waters strongly impregnated, which may serve bases for new solutions, to which the same ingredie may be added in the same proportions as before direct The plants which compose the before-mentioned infusic being very aromatic, are not liable to decomposition putridity during a prolonged period of maceration. waters obtained by maceration, as before mentioned, be employed as bases in the manner to be presently ferred to.

Solution No. 2.

In twenty-four quarts of water I boil for an hour, or lo if necessary, 1 lb. of dry camomile flowers, adding th about half a pound of dry lavender flowers. The mi is then transferred to a woollen filter in order to remov leaves of the camomile flowers, which would otherwise to the goods, being of a very adhesive nature. The to be deprived of their unpleasant odour are immersed i mixture, which is used in a cold state, and contained vessel large enough to admit of their being stretched or s out in it, care being taken to turn them over several in order that the solution may penetrate and act on all of them equally. They are allowed to remain in the for about twenty to twenty-four hours, according t thickness of the particular goods under treatment. A end of that time they are withdrawn and hung on li order to be dried. The disinfecting operation is then pleted. This solution is particularly suitable for goods as alpacas, closely woven silks, woollen stuf cushions, and other articles not composed of caout alone. The solution leaves no noticeable odour, prevents all return of the original smell. For the la flowers about two or three ounces of root of whorl-flo bent-grass (vetyver) may be substituted. This is to b pared as described with reference to solution No. 1 care must be taken to mix up the compound thorough as to effect an intimate commixture of the bent (vetyver) with the camomile infusion. The bent (vetyver) possesses disinfecting properties analog those of camphor, without having the strong odour characterizes that material. The several residua camomile flowers, lavender flowers, and the roots whorl-flowered bent grass (vetyver), are placed toge a vessel filled with water, and may be employed a

strong bases for new solutions of the same nature, or as bases for the solutions to be hereafter referred to.

Solution No. 3.

In twenty-four quarts of water I put 4 lbs. of verbena, chopped up fine, in order to facilitate the maceration, which is performed in a cold state, and requires from twenty-four to thirty-six hours, according to the season or the degree of strength desired to be imported to the solution. In twenty-four quarts of water I boil for an hour or more a pound of camomile flowers. The two solutions are then mixed up, and carefully transferred into a woollen filter in order to get rid of the leaves and residua of the camomile flowers. The mixture is then placed in a wide vessel or vat in a cold state, and the overcoats, woollen goods, alpacas, and manufactured articles, such as air cushions, are then plunged in the vessel; the time they are allowed to remain in the bath varies, according to the thickness of the goods, from twenty to twenty-five hours for the stoutest kinds. The goods are then taken out of the solution, and placed on lines to be dried; the drying being effected in the same manner and with the same results as mentioned with reference to solution No. 1. The residua left from the preparation of this solution, when macerated in cold water, yield solutions which serve as powerful bases for subsequent solutions.

Solution No. 4.

To twelve quarts of the infusion of camomile (No. 2,) I add twelve quarts of the infusion of verbena, No. 3, before described; and in the mixture thus produced I boil for an hour or thereabouts about ¼ lb. of dry lavender flowers, and I then add 1 ½ oz. or 2 oz. of elder flowers, or more, according as it may be desired to render the solution more or less active. The whole is carefully filtered in a woollen filter in order to cleanse it. The solution is placed in a vat, and I then immerse therein overcoats, stout fabrics, air cushions, alpacas, and other closely woven fabrics. The time that the immersion should last depends on the stoutness of the goods, from eighteen to twenty-five hours at the outside for the thickest qualities. They are withdrawn and stretched out on lines, and dried as mentioned in reference to solution No. 1. This solution is extremely penetrating, and effects complete disinfection. If it is desired to impart a greater

strength to the solution for stouter qualities of goods, for such as are generally strongly impregnated with disagreeable smell of caoutchouc, the proportion of e flowers may be increased to an extent that will produce desired effect. It must be observed that the solution att black glazed fabrics, such as black and white che caoutchouc fabrics, having a highly glazed black founda which are liable to become streaked with white, espec when they have been vulcanized. For this reason I rec mend this solution for treating double-faced alpacas black silk goods, to which it imparts fresh gloss. solution, when strongly impregnated with elder flo yields an aromatic odour, which evaporates rapidly in air. The residua of the solution when macerated in w yield liquors which serve as bases for fresh solutions, thereby effect a saving of material. The elder root be substituted for elder flower in this solution; or powder of the root of Florentine iris, or fleur de lis, ma substituted for the elder flowers, using it in the propo of 3½ oz. to 4 oz. This powder imparts to the mixtu which it is boiled a very slight odour; it is, however, penetrating, and at the same time very active as a disin ing agent, and when drying leaves no smell. It ma employed with like advantage in the solutions previ described.

Solution No. 5.

In twenty-four quarts of common water I boil 1 l camomile flowers, adding ¼ lb. of Florentine iris in po and boiling the whole for about an hour, after whi is passed through a woollen filter in order to puri The mixture is then poured into a vat, and when cold goods to be deprived of their unpleasant odour are plu in it, care being taken to turn them so that the sol may penetrate them sufficiently. They are left in the from eighteen to twenty-four hours, according to thickness, and are then withdrawn and dried, as desc with reference to solution No. 1. This solution is ticularly adapted for fabrics of light texture and colours. The quantity of iris powder may be reduced the root of whorl flowered bent grass (vetyver) adde recommend this solution as well adapted for silks, ve in short, to all fabrics which are worn as articles of fa apparel, and for covering parasols and umbrellas.

residua are retained in a vessel, and covered with water to serve as bases for new solutions prepared in the same proportions.

Process No. 1. (By cold immersion, adapted especially for delicate caoutchouc goods intended for ladies' wearing apparel.)

In a wooden vat lined with sheets of zinc about six feet long to four feet wide, and about eight or ten inches deep, and closed, when required, by a wooden cover also lined with zinc, I prepare the following solution:—To forty-eight quarts of water I add 1 lb. of camomile flowers, green or dry; and then, after boiling the same for nearly an hour, I add ¼ lb. of Florentine iris root. I then strain the whole through a flannel filter. The residua may be macerated in cold water, as before mentioned, to act as bases for new solutions. This solution when cold is poured into the vat before mentioned, and one pint of alcohol, which may be perfumed at the pleasure of the operator, is added in order to strengthen the solution. The perfume I prefer for this purpose is English honey in the proportion of ¾ oz. This mixture should be well stirred with a boxwood spatula. The goods are then placed in the vat, spread out flat; they should be turned about frequently, so that the solution may completely penetrate them, taking especial care only to put into the same bath goods of about the same colour, stoutness, and quality. The vessel should be covered while the goods remain in it. The time for steeping the goods will vary according to the activity of the solution, and particularly to the different qualities and thicknesses of the goods. Fifteen hours are sufficient by this process for silks of light colours and textures, alpacas, and others of the same description. For black silks, and light woollens, merinos, kerseymeres, cashmeres, velvets, wollen cloths, &c., twenty or twenty-four hours would be sufficient. This process expels all unpleasant smell from the goods, removes all likelihood of such smell returning, and substitutes for it a very pleasant odour. When the goods are impregnated with the solution they are withdrawn and placed in a drying stove, as referred to previously. They should remain there only a few hours, and should, when quite dry, be hung on lines in the fresh air, after which they are ready for use. This process is cheap, and the solution is serviceable up to the last drop. It fits articles for use as

articles of wearing apparel for ladies, which might not otherwise have served such purposes.

Process No. 2, to be employed for removing unpleasant smell from articles, such as india-rubber bands, thick gum rings for babies, india-rubber balls, sponge bags, and other articles of a similar class.

An earthen pan or vessel adapted to the dimensions of the articles under treatment, and provided with a cover, should be used for this purpose. Twenty-four quarts of an infusion of any one of my inodorous mixtures, Nos. 1, to 5, are taken for base; but I take for the present instance the mixture containing the elder flower infusion; to this infusion should be added one pint of spirits of wine, in which should be mixed 1 oz. essential oil of lavender, and about forty-five grains troy of hydrochloric acid. The whole is to be well mixed with a wooden spatula. This odoriferous mixture will be found of great strength. The goods are placed in the solution in a suitable vessel, and the vessel being closed, they are left therein for not less than thirty hours. When the goods are removed from the bath they should hang up to dry in the open air, which takes at the utmost from ten to twelve hours; when dry, they are taken down, having acquired a greater or less amount of agreeable odour, according to the strength imparted to the solution by the essences and tinctures used. A vessel holding twenty-four quarts of mixture will contain easily 2,000 bands or rings. In order completely and regularly to expel all unpleasant odour from india-rubber balls it is advisable to introduce the solution into the aperture used for admitting the air, for which purpose the ball should be pressed with the fingers so as to cause the mixture to be drawn in, when it will sink, and be covered by the solution or mixture. This plan would also answer for air bottles, cushions, and other articles of that description, in which the mixture is required to act on the inside as well as the outside to completely free it from unpleasant smell. When the caoutchouc goods to be treated are of a red colour, (if there should be many to be disinfected,) they should be treated in a separate vessel, and to the twenty-four quarts of the base of the solution should be added about one-fifteenth of an ounce of sulphuric acid; but this acid should be employed very sparingly, as it would destroy or injure the goods if used in too large quantities. It imparts, when used in the proportions

mentioned, a great gloss to articles of a red colour, owing to its colouring property. It must not, however, be added to the other solutions, as its effect would there be very injurious.

The following is a method of utilizing the colouring property of this acid for dyeing the fabrics covering the caoutchouc red and madder colour:—After having removed by any one of my processes the unpleasant smell from a piece of fabric, black and white checked on one side, and black glazed on the other, a vessel of sufficient size is half filled with a solution composed of twenty-four quarts of infusion of the root of whorl-flowered bent-grass (vetyver) or camomile flowers, to which are added 1½ oz. of sulphuric acid; and after the mixture has been well stirred and mixed together the fabric under treatment should be completely immersed therein, and allowed to imbibe the solution for about five or six minutes; it should then be withdrawn and stretched on a line, where it will acquire a red colour as it dries; and when completely dry it will be of a very fine red colour; but care should be taken not to leave it longer than five minutes in the solution, on account of the destructive property of the sulphuric acid, which would burn the fabric. If desired, a blueish tint may be imparted to the same red stuff. My solution No. 1, should be used as a re-agent; the red fabric has only to be placed in this bath, and kept there for three hours, and when withdrawn it will have acquired a blueish black colour. Or the same result may be attained thus:—Instead of first disinfecting the fabric as when it has to be dyed red, it would suffice to immerse it in its unpleasantly smelling condition into the colouring solution before described, and then afterwards to expel its disagreeable odour by disinfecting it in bath No. 1, whence it would be withdrawn dyed after being dried of a blue colour. These dyeing processes open up several methods of employing caoutchouc goods advantageously without destroying their flexibility and impermeability.

Another solution of a highly disinfecting nature may be made with my lime solutions (to be referred to further on), to every twenty-four quarts of which should be added 1 lb. of elder flower, and from four to eight ounces of ginger root, and the whole should be boiled for an hour in two quarts of water. In this case it would be useless to strain off the residua, which by their presence impart a stronger action to the solution. Into this mixture to every twenty-

four quarts should be added either an ounce of liquid chlorine, or ½ oz. of hydrochloric acid; but this should be very sparingly used, so as not to injure the fabric, as otherwise an injurious hardening effect might be produced. In this cold solution the goods to be treated should be stretched out flat, and allowed to remain in the bath for from thirty-six to forty-eight hours (but no longer) for the stouter qualities. On coming from the bath they should be well washed in clean water. After being washed I place them in a drying stove or chamber, the temperature of which may be carried to a very high degree, on account of the quality and stoutness of the fabrics. The heat, however, should not be raised high enough to shrivel them. They should next be hung on lines in the open air, and are then ready for use, having acquired no other than a very slight odour from the elder flowers.

When it is desired to impregnate fabrics with agreeable odour, so as to render them fitted for various uses for which their unpleasant smell has hitherto prevented their being employed, but for which their elastic and waterproof qualities would make them particularly serviceable, such as bindings for books, &c., covers or cases for articles of value, which it may be desired to keep from damp, &c., &c., the disinfecting bases described from Nos. 1 to 5, may be used at pleasure. Alcohol or acids should be added if pure caoutchouc is to be treated. If light thin fabrics are to be treated, then essence only or alcohol should be added. Alcohol is a powerful agent when employed for pure caoutchouc goods, and used in such proportions as not to be too active. If to these solutions essence of birch tree is added (which essence imparts so pleasant a smell to Russian leathers), the goods thus treated will be preserved from insects, especially in libraries, essences for the same purpose may also be composed with camphor on an alcohol base, also camphogenic acid (acide camphogéne), as it is called by Mr. Dumas, may be employed. It is an active disinfecting agent, but its burning properties render many precautions necessary in its employment. Experience would regulate the proportions in which it should be used. More than fifteen drops to twenty-four quarts of the solution should never be used, especially for aromatic solutions. Thus it may be added in the proportion mentioned in aromatic perfumed solutions, such as those of camomile flowers, whorl-flowered bent-grass (vetyver), tamarind leaves,

black tea leaves, leaves of various laurels, and orange trees, and sage, all of which may enter into the different solutions as bases, or combined with other flowers, leaves, grains, berries, and fruits, which would be too tedious to enumerate here, but which, nevertheless, I claim as contributing to the results which I have for my object. I note for the same purpose the leaves and flowers of roses, peach trees, &c.; rose water, lavender water, whorl-flowered bent-grass water (eau de vetyver), essences of patchouli, lemon, musk, &c., tincture of clove, cinnamon, and ginger; in fine, all known essences and fragrant waters. All may be used in my processes and solutions in proportions which cannot be here fixed, but which may be taught by practice. By means of these solutions all descriptions of fabrics made of caoutchouc, or combined with caoutchouc, each process being applied respectively according to the quality, colour, and stoutness of the particular description of goods under treatment.

Process of Disinfection by Dry Fumigation.

I employ for this process the following apparatus:—A large case or frame made of wood, iron rods, copper, or other metal, and of the shape shown in the drawing annexed. The dimensions of the case vary according to circumstances. The four sides are covered with metallic or wire cloth, with square meshes, as shown in the drawing; the meshes may be of any required width. I place this frame in a chamber arranged as a drying stove, heated by currents of hot air of a temperature higher than that used for the ordinary drying, of which I have previously spoken in reference to different cold and warm processes. In order to raise the temperature of the drying stove to the requisite degree, producing a softening effect in the caoutchouc goods, care should be taken that it be not too strong, so as to shrivel them, for which reason the heating should be gradually effected, and practice would regulate the point to which it should be raised. By an aperture in one of the sides of the frame an iron stand is introduced and placed in the centre of the frame; on the stand is placed a metal basin or vessel forming a perfuming pan. Under the perfuming pan I place a spirit lamp (oil which emits smoke must not be employed). The flame should proceed from three or more cotton wicks well spread out, and arranged so as to embrace the whole of the lower part of the perfuming pan, which is intended to hold the various ingre-

dients intended for fumigating, which are to be lighted or caused to emit vapour by means of the spirit lamp. Matters being thus arranged, the caoutchouc fabrics (overcoats and goods in caoutchouc not covered by any other material,) should be extended as flatly as possible on the four sides of the pyramidal apparatus or frame, so that the smoke and the vapours of the fumigating substances may penetrate the same completely, the high temperature of the drying stove contributing thereto. This disinfecting process occupies generally two or three hours, according to the nature or stoutness of the goods under treatment, and according to the strength of the disinfecting ingredients. When the goods are withdrawn from the drying stove they should be placed on lines in a drying chamber, provided with a strong double current of air. After leaving them there twelve, fifteen, or eighteen hours, the overcoats and fabrics will have lost the odour more or less strong of the various agents employed in the fumigating process. The top of the frame should be covered with a moveable wire cloth so as to allow the vapours to be diffused in the drying stove, and thus come in contact with every side of the goods subjected to their action. In the spaces not covered by the fabrics, and on the angles of the frame, I place here and there caoutchouc bands for papers, sponge bags, tobacco pouches, in short, any small articles of such description; so arranging them, however, as not to place one article on another, or to allow them to interfere with each other, thereby turning the surface of the apparatus to good account. The upper transversal rods of the four sides of the framing should be provided with hooks and screw rings, on which may be hung the articles placed round the apparatus, either by means of cords or by hooks, as is done in the drying process. Among the substances or ingredients suitable for these fumigating processes I think it useful to mention the principal:—The essences of patchouli, whorl-flowered bent-grass (vetyver), benzoin, and ginger; honey water, ginger water, sweet marjoram water, tincture of cloves, jasmine, Florentine iris, vanilla, rose, orange flowers, lemon flowers, bergamot, neroli, rosemary, &c., &c.; dry flowers of lavender and elder flowers may be used, which may be mixed with iris powder and with dry grated lemon peel. The whole may be made into a paste with a little water, to which twice the amount of alcohol may be added. This paste is placed in the perfuming pan, where it burns slowly, sending forth a very

thick smoke, which penetrates the goods and disinfects them. Orange peel and scented pastilles may also be employed, &c. Fumigating pastes may also be made with iris powders, crushed aniseed, cinnamon, juniper powders (the odour of which is of a very penetrating nature), clove tamarind leaves, mint, laurel, world-flowered bent-grass root (racine de vetyver), &c. I recommend these pastes as being easily prepared and very cheap.

As regards the fumigating processes by means of essences, I recommend the following; and it should be observed that I always form the pastes which I have mentioned with iris powder, in order to obtain fumigating agents which do not evaporate as do those of pure essences, and which are therefore more expensive, without moreover yielding the same result as I obtain from these pastes in the composition of which the iris powder enters. I take about 1 oz. of this powder, which I mix with the essential oil of lavender, and I place the pastilles composed of this mixture in the perfuming pan, where they emit, while burning, a penetrating smoke. This mixture is cheap and successful.

Other odoriferous and perfumed aromatic pastes may be made of different descriptions, with flowers, fruits, grains, berries, leaves, roots, &c., mentioned in my various processes, and which I claim without naming them here.

I here annex the description of mixtures to be employed in following my non-perfumed fumigating processes. I take some flower of sulphur, and mix or dilute it with liquid ammonia, say 1 oz. of flower of sulphur to half that quantity of ammonia; or, instead of ammonia, liquid chlorine or chloride of zinc may be used as having a strong disinfecting effect. I compose, as I have before stated, a paste which I saturate with some drops of alcohol; I then place this paste in the perfuming pan, where it burns slowly, emitting a very thick smoke, and exercising a strong action. However, care should be taken, in using this mixture, only to subject thereto fabrics with a plain white ground, or black and white fabrics made of caoutchouc only, or, in short, only such goods as are not liable to be discoloured by the chlorine and flower of sulphur. This mixture, when used for fumigating purposes, is one of the strongest and most active as a disinfecting agent; it is well adapted for air mattrasses, air cushions, &c., owing to their plain colour. The penetrating odour which it imparts to the stuffs is expelled when they come out of the fumigating process, by

subjecting them to a double current of air for a
of time, regulated according to circumstances. In
more certainly to remove this odour of chlorine and s
the goods should be immersed for two or three hours
of the cold baths composed as described as No. 1,
and then dried in the manner described in refere
goods treated in the said solutions. Great care
be taken, when making use of this mixture of sulph
chlorine, on account of the suffocating emanation
proceed therefrom, and are so injurious to health.

Another mixture may be made with about 1
Florentine iris powder, and ½ oz. of powdered ca
with $\frac{1}{13}$ oz. of salt of nitre, saturated with some
of alcohol. This paste burns slowly in the perfumin
and not only dissipates the unpleasant odour attach
caoutchouc goods, but also leaves a very agreeable an
brious perfume on account of the properties of the ca
entering into its composition. This mixture is ver
pensive. Light coloured overcoats may be treated
fumigating process, as also silk fabrics which may be
cable for ladies' wearing apparel, fabrics for air cu
mattrasses for children's cradles, &c.

Other pastes may be composed of resinous gums,
them invariably with iris powder or with maize fl
which small portions of alkali or sulphurous aci
be added. This paste should be made into small cak
burnt in the perfuming pan; such fabrics should
jected to these processes as are not liable to be disc
by the influence of certain acids, such as sulphurou
&c.

These cheap mixtures have each respectively a stro
weaker action, but all lead to the same results.
withdrawing the goods they should be subjected
double current of air referred to in order to dissip
predominant odour. In order to turn the appear
good account it is better only to place therein fabrics
same degree of stoutness, &c., so as to fumigat
uniformly and regularly.

***Inodorous Process by Immersion in Solutions of Lim
or warm, particularly well adapted for Mattrass
Cushions, and the like, before or after being made u***

**To eighty quarts of whitewash or lime white I ad
or eighty quarts of water, and allow the whole to s**

about four hours, when I draw off all but the thick sediment, and run it into a vessel of suitable size and dimensions. I take about twenty quarts of this liquid from the vessel, and boil in it (for about an hour) 1 lb. of pounded iris root, to which I add ¾ oz. to 1½ oz. of pounded ginger root; I then filter the solution through a woollen filter, and return it to the vessel. Instead of this iris and ginger solution, any of the solutions from No. 1, to No. 5, may be substituted, all being equally well adapted for counteracting the odour of the lime solution. This odour is destroyed by the amalgamation of the different solutions in the proportion of sixteen to twenty-four quarts mixed with the entire bath. If only light textured white grounded fabrics are to be disinfected the iris and ginger solution would be preferable, which would not increase the tendency of the lime to impart a black colour by oxidation. When this mixture has been well stirred with a wooden spatula the goods (of white colour), either in piece or made up, should be spread out therein, and turned about frequently, in order to make the solution penetrate in an uniform manner, which is very essential. Care should be taken only to put in one immersion at a time goods of the same colour, especially when they are quite white, or on a white ground, and they should be spread out with the least number of folds possible, so that when in the bath the action of the solution may not mark one part of the fabric more than another. The goods should only be allowed to remain in the bath fifteen, eighteen, twenty, or twenty-four hours at the utmost, even for stout fabrics. I do not here refer to pure caoutchouc goods. The goods under treatment are taken out of the bath, carefully washed and gently brushed while being subjected to the action of a current of cold water, after which they are placed in a warm drying stove, and when removed from the same are stretched on lines to dry in the open air, when all odour will have disappeared. For coarse fabrics, the strength of the solutions should be increased by immersions of greater or less duration, so that the goods come out of the bath flexible, impermeable, and exempt from disagreeable smell.

This lime solution may be also rendered more active by raising the temperature to the bath up to boiling point, but this kind of boiling immersion only suits very coarse black fabrics unglazed on both sides.

Combined Vapour and Pressure Process (particularly cable for Caoutchouc Fabrics not made up into Garm

The process consists, firstly, in the employme steam chamber; lines are so arranged therein, and distances apart, as to leave room for the passage operator who hangs up the goods. The goods havi spread out in this chamber, fumigating vapours are circulate therein, such vapours being of a sufficien temperature to soften the fabrics, but not to such a as to injure the waterproof properties of the cao fabrics.

The activity of the vapours depends on their com of the matters from which they emanate, and whic proceed to detail. To twenty-four quarts of verbe sion (No. 1, cold-bath process) I add about three o root of whorl-flowered bent-grass, which should be in a cold state in the verbena solution. In the wh ounce of salt of nitre should be dissolved, and th must be filtered. I then evaporate this solution suitable means, and introduce the vapour into th chamber, when the fabrics suspended therein will b fected in about two hours.

The solutions may be multiplied and varied by s ing others for the agents or ingredients mention example, the root of whorl-flowered bent-grass replaced by half a pound of Florentine iris root, boiled for about an hour in the verbena solution. nitre is introduced into this mixture, especially if t to be subjected to this process are of a light colour. one-fifteenth of an ounce of alum (in powder or lump be added, care being taken to dissolve it complete mixtures which compose the evaporating solution tions of the same kind may be employed as those d under Nos. 1 to 5 (in the cold-bath process), and respectively salt of nitre or alum, or else using, in nitre and alum, one ounce and a half of spirits o every four quarts of the solution.

These solutions do not impart any perceptible the goods submitted to them.

The steam or vapour from these solutions is a only to the finer qualities of caoutchouc fabrics, silks, alpacas, light woollens, and fabrics suitable f

wearing apparel, which may have an agreeable perfume imparted to them by adding a small quantity of essence of musk or honey-water, or of essence or oil of lavender, or of any aromatic essence, or odorous resinous substance. When the goods are withdrawn from the steam chamber completely impregnated with vapour, they are to be placed in hot-air drying chambers, and there left until they have become almost dry. They are then transferred to a firm table, having a wooden top entirely covered with a sheet of zinc, and well polished; the width of this table should be regulated according to that of the goods under treatment. The goods placed on the table in a state of moisture are subjected to the action of a roller or flattening cylinder made of tin, about forty pounds in weight. This roller should be quite solid, and of the same width as the table, and it should be provided at each end with a turned box-wood handle, in order to its being conveniently worked by two persons, one on each side of the table, who roll it from one end to the other, and exert an uniform degree of pressure on the goods, and thus restore their gloss. Before subjecting the fabrics to the action of the roller, they should be covered completely with a piece of flannel. The pressure may be repeated two, three, or four times on each length of fabric, and may be applied in any other suitable manner. The flannel should be changed or wrung out from time to time when it has absorbed moisture from the fabrics under treatment. After the goods have been reglazed, or have had their gloss restored under the roller, they are hung on lines in the fresh air, and folded as soon as dry, to be ready for use.

Solutions composed of the same bases as those described, but combined with more active agents, may be employed for stout tartans and Scotch plaids. Such agents as, for example, camomile flowers, prepared, as before described, with elder-flowers in sufficient proportion, would destroy the strong smell of the hydrochloric acid or sulphurous acid added in small proportions to the base of each solution. These disinfecting agents should be used with great care, on account of the injurious effect they are liable to exercise on the colours of certain fabrics, especially hydrochloric acid, the action of which, when strengthened with about one-fifth of an ounce of spirits of wine added to the solution with which this acid is employed, assists greatly in dispelling the smell of the caoutchouc. However, no particular precautions need be taken in treating fabrics with plain

black or white grounds, and air-cushions, and also such fabrics of a yellow colour as may have had this colouring base in the dyeing process.

With respect to inodorous mixtures, which should be composed, as I before stated, of highly aromatic plants, so as to dispel the slightest trace of the smells of the various acids used, they do not leave any perceptible odour in the fabrics. I style this part of my invention "galvanization of caoutchouc fabrics," for such as have been subjected to the process do not lose any of their qualities of imperviousness and plastic firmness, whatever the temperature to which they may be exposed in course of the various uses to which they may be applied.

Such sulphuric acids as have colouring properties are suitable for my process when applied to fabrics dyed in red, especially by madder, a dyeing agent which resists the action of this acid. The lowest proportions should be adopted, so as to avoid injury being done to the goods. When other colours except red are under treatment, this agent should be entirely dispensed with.

Disinfecting Process for Plain Brown and Black Goods (only).

In a wooden vat lined with zinc, and of suitable dimensions, I pour forty-eight quarts of water, in which are infused six pounds of dry chopped verbena for thirty-six hours, but not longer. The infusion is then passed through a flannel filter, and the residuum put aside, and subjected to a fresh maceration. In eight quarts of this infusion, one pound of green or dry elder-flowers is boiled for an hour, and the residuum left in the solution of forty-eight quarts, two pounds of wood charcoal, and one-fifth of an ounce of hydrochloric acid, the whole being mixed up with a wooden spatula. The goods to be treated are spread out in the solution as flatly as may be, and are turned about so that they may be well penetrated by the solution. Only goods of the same quality, colour, and stoutness can be treated in this bath. After leaving them there twenty-four hours, the fabrics should be taken out, washed carefully in a tub, through which a stream of cold water is made to pass, in order to remove the pellicles of the elder-flower and the black from the charcoal. They are then placed in the drying stove adapted to the process referred to in the Specification as No. 1. This mixture may be varied by using for its base

an infusion of camomile flowers (one pound to forty-eight quarts water), boiled with one pound of green or dry lavender flowers instead of elder. The residuum should be left in the solution to induce a kind of fermentation, which renders it more active; two pounds of wood charcoal are added, and instead of acid or liquid chlorine, about three-quarters of an ounce of camphor dissolved in the same quantity of spirits of wine are then thrown in. The solution thus composed is very active for such goods as leggings, black kerseymeres, black cloths, silks, and close-woven alpacas, caoutchouc straps, sponge bags, &c., &c. Fabrics made of caoutchouc alone should remain in the solution twice the time required for disinfecting thinner fabrics. When removed from the vat containing the solution, the goods are to be transferred into a vessel, through which passes a stream of fresh water, in which the charcoal powder and the sticky portions of the camomile are washed off them. These different mixtures are very cheap and simple in their composition, and, owing to their aromatic and disinfecting qualities, remain a long time without spoiling. In the last solution, in which camphor is employed, if charcoal is dispensed with, the solution may be used for coloured fabrics, if not quite white, yet such as are lightly coloured.

Process analogous to Leather Tanning.

In this process I make use of a wide vat, made either of wood or of zinc, or of wood lined with lead (which is preferable). In this vat are poured the different residua of solutions Nos. 1 to 5, mentioned in the first part of my description. But, as it would be difficult to measure them, they should be thrown into the vat with their waters of maceration, and when their bulk reaches from about three inches to three inches and a-half in height, the rest of the space which remains empty may be used for the goods to be immersed. The operator takes ten pounds of the bark of young branches of horse-chesnut tree, birch, oak, or peach tree (the two first being preferred), pounded, but not reduced to powder; when dry or green horse-chesnuts can be procured, they contribute largely to the success of the process; oak sawdust, and especially mahogany sawdust, is then added, together with a quarter of an ounce of liquid chlorine, or half that quantity of hydrochloric acid, or of chloride of zinc. I find liquid chlorine preferable, with the

addition of about one-fifth of an ounce of liquid amı
Before placing the goods in the vat, the mixture shou
well stirred with a wooden spatula, and left to subsi
four or five hours, a sufficient time for fermentation t
place. The fabrics are placed in the vat, spread ou
arranged in layers, as is done with skins, and they are
as much as may be necessary for effecting the penet
of the solution, which, although somewhat thick, ye
tains a sufficient amount of liquid to soak in. The
thus placed remain in the vat for twenty-four hour
even thirty hours, according to their nature. Afte
have been withdrawn from the disinfecting bath, th
carefully washed in a vat through which a stream of
flows. They should neither be wrung nor rubbed by
but if some of the residuary matters adhere too clo
firm but soft brush may be used, when necessary, a
rest done by rinsing. The fabrics thus cleaned are
in drying stoves, whence they are withdrawn deprived
unpleasant odour and ready for use. This process is
mical, because it turns to account the residua of the
processes.

This process is only applicable for fabrics com
black, fabrics for trowser legs, and goods of that descr
whether made up or not. It should not be applied to
of any colour liable to be injured by acids. Fabrics
ferent stoutness, qualities, &c., should not be treated
same bath and at the same time.

To the residua before described may be added the
resulting from the brewing of beer, which, when u
combination with other residua, would not impa
unpleasant odour, as might be the case if used alone.

And having now described the nature of my said
tion, and in what manner the same is to be perfor
declare that—

I claim the treating of caoutchouc, and goods co
wholly or partly of caoutchouc, in the manner and
purposes hereinbefore described.—In witness, &c.

EUGENE DE VAR

Specification of the Patent granted to CHARLES SCOTT JACKSON, *of Cannon-street, City, for Improvements in Preserving Seeds, Potatoes, and other Roots.* — Dated October 12, 1853.

To all to whom these presents shall come, &c., &c.— The object of this invention is to preserve seeds, potatoes, and other roots from mildew, rot, fungus, and worms; and consists of subjecting them to or applying to their surfaces salts of zinc.

For this purpose salts of zinc are, by preference, dissolved; and the seeds, potatoes, and other roots are steeped therein.

In carrying out my invention I employ principally the sulphate of zinc; but any of the salts of zinc may be used, though not, I believe, so advantageously.

Before preparing potatoes for seed I wash them clean and then cut them in the usual manner if too large, and I immerse them in a solution of sulphate of zinc, mixed in the proportion of one pound of the dry salt to twenty pints of cold water.

I allow them to remain in this solution from eight to twelve hours, according to the size of the cuttings, (large or small,) or I mix the sulphate of zinc with boiling or very hot water, in the same proportions, and when the solution is cooled down to 100 degrees of Fahrenheit, I immerse the potatoes or cuttings for seed, and allow them to remain therein, according to their size, an hour and a-half or two hours. I then take them out for planting.

If I wish to preserve potatoes from one season to another I prepare them in a solution mixed in the proportion of one pound of the sulphate of zinc to twenty pints of water, in which I allow them to steep four hours.

They should then be carefully dried and stored in the usual manner.

If kept all through the winter and required for seed in the spring they should be cut and steeped one hour in the solution, heated and mixed as before directed.

Wheat, barley, and oats, and other such grain should be steeped four hours in a cold solution of the sulphate or other salt of zinc, mixed in the proportion of one pound of the salt to thirty pints of water.

Clover, turnip, potato, and other small seeds should prepared and dried in the same way, except that th hours' steeping in a cold solution, mixed in the proport of one pound of the sulphate of zinc to forty pints of wa will be sufficient.

Although I have mentioned the sulphate of zinc I do confine myself to the use of that salt, as any of the solu salts of zinc may be employed, though I consider the s phate the best.

Neither do I confine myself to the proportion of salt water mentioned above, as other proportions may employed.

But under ordinary circumstances I consider the ab proportions as most useful.

I find by experience that rats, mice, and other ver will not eat seeds prepared as above.—In witness, &c.

CHARLES SCOTT JACKSO

Specification of the Patent granted to FREDERICK WAR *of the house of John Warner and Sons, of the Cre Jewin-street, City, and* JOHN SHOTTON, *Foreman, i employ of the said John Warner and Sons, for Imp ments in the Manufacture of Large Bells.*—Dated Oc 10, 1853.

To all to whom these presents shall come, &c., & Heretofore in casting large bells it has been usual to up a core and to coat it with loam, which when dr been covered with hay bands or other material, and with loam, such covering when dry representing th tended bell in thickness and device; and from this pattern a loam mould on a suitable frame has been t which mould (after being removed from the core an pattern of the bell taken away) has when dried been together with the core for casting the bell.

Now, by our invention, we build up a core and c with loam, as heretofore, or we make the core of a c of iron coated with loam, but in place of making the mould from a pattern bell produced on the core, as fo practised, we employ a vessel (preferring one of cast

perforated with numerous holes, and of a size somewhat larger than the intended bell, within which we apply a coating of loam, and by a suitable strike or pattern we produce the desired form of mould, and we make any device in such mould that may be desired to be on the bell. This mould and the core are when dry used for casting the bell.

Having thus stated the nature of our invention, we will proceed to describe the manner of performing the same.

And we would state that although an ordinary core may be used when casting a bell, we prefer to have the core made of a hollow iron-casting perforated all over with holes. The exterior of such casting corresponds as nearly as may be with the interior figure of the intended bell, but it is less in dimensions in order that its surface may be coated over with a surface of loam to make up the precise form and size of core desired. The loam on such casting is by a strike (which is caused to move round the core, as is well understood,) made correctly to represent the reverse of the interior of the intended bell, which is to be cast thereon. In place of building or forming (on the outer surface of the core, as heretofore,) a thickness of material corresponding with the thickness of metal of which the intended bell is to consist, or, in other words, in place of making a temporary bell of loam and other matters on the core, and then taking therefrom a cast to constitute the outer mould for the bell, we construct the outer mould without the aid of such temporary bell, and without the aid of the core, and in place thereof we produce the outer mould by using a hollow iron-casting perforated with numerous holes, and having its interior form corresponding generally to the exterior form of the intended bell, but such interior is made larger than the exterior of the intended bell, in order to admit of an internal coating of loam being applied, which loam surface by the aid of a strike or template rotating on a central axis within the mould, is made to assume the form for producing the correct exterior form of the intended bell. The core and the external mould being thus produced are dried, and then placed correctly together, and the bell is to be cast in the ordinary manner. By these means of preparing or forming of the exterior mould and the core, the expense of making a temporary bell of loam and other matters on the core

will be avoided, and the making up of suitable moulds for casting large bells will be greatly facilitated, and great correctness of manufacture ensured.

What we claim is, the mode of manufacturing large bells, herein described.—In witness, &c.

FREDERICK WARNER.
JOHN SHOTTON.

Specification of the Patent granted to HENRY CONSTANTINE JENNINGS, *of Great Tower-street, in the City of London, for Improvements in Treating and Bleaching Resinous Substances.*—Dated September 17, 1853.

To all to whom these presents shall come, &c., &c.—The object and intention of this patent is to remove the colouring matter and other vegetable principles that become coloured when calophane is combined with the fixed or volatile alkalis, so as to render cheap resinous substances more available for the purposes of manufacturing soap or candles; for obtaining this end I combine, for example, seventy-five pounds of calophane with twenty-five pounds of common tallow, palm oil, cocoanut oil, paraphine, or any other fatty matter, whether of animal or vegetable or mineral origin; by submitting them in the above proportions (or any other proportion according to the nature and quality of the substances that may be to be operated upon) to a temperature of from between 250 degrees to 350 degrees Fahrenheit, until their fusion, combination, and assimilation is effected, which will take about one hour. When a perfect homogeneous mixture of the two or more substances is produced, and all accidental impurities or foreign substances are separated and removed, and the mass is cooled down to about 200 degrees Fahrenheit, I add eight ounces of nitrate of protoxide of mercury, dissolved in one pint of water, at about 200 degrees of Fahrenheit; the whole must be well stirred and mixed, and kept boiling at 212 degrees Fahrenheit for about twenty or thirty minutes, more or less, according to the bulk of the matter under treatment. I now add four and a-half pounds of bi-carbonate of soda, and one pound and a-half of pearl ashes, or of bi-carbonate of potassa, keeping the whole well

agitated and mixed for about half an hour; then add slowly, or by degrees, eight or ten pints of water, constantly stirring, so as to perfectly incorporate the water with the resinous and fatty matters; now let the whole boil as completely as possible for about two hours, adding water from time to time, to compensate the water driven off by evaporation. Now suspend the action of fire, and add sixteen pints of cold water, mixed with twenty-four ounces of aqua ammonia, of about 880 specific gravity; stirring and mixing the whole until the mass is reduced to the atmospheric temperature. Separate the coloured water and other more fluid or liquid parts from the white and more solid parts, either by filtering or by centrifugal motion; and when this is done, wash the mass with common water until the whole is white; in this state it may be combined with soap, when in a fluid state, in any proportion the manufacturer may judge fit. For the purposes of uniting the stearine and calophane with matters intended for combustion or the production of light, a further manipulation is necessary, that is to say, the solid white matter as above recited and prepared, must be heated to 150 degrees or 160 degrees Fahrenheit, with a dilute solution of acetic acid and hydrochloric acid, say about two pounds of hydrochloric acid and one pound of strong acetic acid, and forty or fifty pints of water, the whole to be well agitated for about one hour or more; then filtered or separated by the aid of centrifugal motion, and wash perfectly with cold water; when dry it may be used in such quantity or proportions as the manufacturer of candles, night lights, &c., may deem expedient.

I claim the combination of calophane mixed with tallow, and all fatty matters in every proportion, with nitrate of protoxide of mercury, and neutral bi-carbonates of soda or potassa, or aqua ammonia, or pearl ashes, as the nature of the animal, vegetable, or mineral fatty matters require; and with paraphine obtained from bog peat, coals, &c.—In witness, &c.

HENRY CONSTANTINE JENNINGS.

Specification of the Patent granted to CHARLES W
of No. 15, *Selwood-place, Old Brompton, and* E
BURGESS, *of No.* 7, *Percy-street, Bedford-square, both*
County of Middlesex, for Improvements in Pulpin
Disintegrating Vegetable Substances.—Dated Augus
1853.

To all to whom these presents shall come, &c., &
This invention has for its object better means than tho
present practised for disintegrating and pulping vege
substances for the manufacture of paper and other fa
for which purpose we take, for instance, chips, shavin
wood, or sawdust, and boil for some hours in wat
stream of sulphurous acid is passed through the mass
partial bleaching is effected. The matters are then
washed and placed in a solution of chlorine, chlori
chlorous acid, called also the peroxide and protoxi
chlorine. The matters are kept in the solution till
white and the fibres are disintegrated, or we employ ch
of sodium decomposed by electric agency. After the
treatment we heat the fibrous mass in a warm and
solution of caustic soda or potash.

Having thus stated the nature of our said inventi
will now proceed to describe the manner of performi
same.

The wood or vegetable substance upon which
intended to operate by this process should first be re
to very fine shavings or cuttings, the finer the better
may be done in any suitable machine.

The shavings are then to be boiled in a solution of c
alkali, the strength of which being dependant on the n
of the vegetable substance operated on can only be le
by experience. For deal or fir wood we find that a so
of alkali of the strength indicated by twelve degrees o
English Hydrometer answers very well. The length o
necessary for this part of the process is somewhat depe
on the nature of the vegetable substance to be treated

We find boiling in a solution of caustic alkali
pressure of considerable service.

We do not claim this operation as a part of our inve

The shavings are then to be well washed and pu
and the washings may be saved and evaporated dow
burned in a suitable furnace, when they are again ava

r the same purpose. The damp shavings are now to be posed to the action of chlorine or the compounds of lorine with oxygen, till on a portion being placed in a lute solution of caustic alkali, the vegetable substance lls into a dark pulpy mass.

This part of the process is conveniently effected by cing the damp shavings on racks or drawers about nine ches apart, one above another, arranged in a chamber, d allowing the chlorine, or the compounds of chlorine, th oxygen, to enter the chamber and fill it. Of the npounds of chlorine with oxygen, we prefer that known protoxide of chlorine, or hypochlorous or chlorous acid, euchlorine.

If found more convenient, the chlorine, or the compounds chlorine with oxygen, may be used in aqueous solution, tead of the gaseous form.

As soon as the shavings have been sufficiently acted upon the gas, as may be ascertained by the method above- cribed, they may be removed, and the hydrochloric acid, ich is the result of the above process, removed by washing, l the shavings well pressed.

This should be done with as little water as possible, as s acid may be saved, and made use of for the reproduc- n of chlorine.

The shavings are now to be placed in a weak solution of stic alkali, when they will fall into a pulpy mass of a k brown colour. This part of the process may be expe- ed by exposing the mass to the action of a beater, or ngine," placed in the tank containing the solution of ali.

The pulp obtained as above described, having been freed m the alkali by washing (which may be saved as before ected), may now be bleached by the usual process, or, as prefer, by chlorite or hypochlorite of soda, or potash, erating the chlorous or hypochlorous acid by hydrochloric d.

In the above processes we do not confine ourselves to the rticular apparatus or utensils herein named, but claim the e of the chemical processes, and in the order herein stated.

In witness, &c.

CHARLES WATT.
HUGH BURGESS.

Specification of the Patent granted to CHARLES GOODYEAR, *of Avenue-road, Saint John's Wood, in the County of Middlesex, for Certain Improvements in the Manufacture of Brushes, and Substitutes for Bristles.*—Dated July 15, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of forming the handles and backs of brushes, by combining india-rubber with sulphur, with or without other matters, and subjecting the compound to heat till the same is changed into a hard substance; and the making of substitutes for bristles consists of forcing such compounds through perforations in metal plates, so as to obtain the same, when subjected to heat, in a state to be used as bristles.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

In order to make handles of brushes according to my invention, I employ the hard substances produced by combining india-rubber and sulphur, with or without other materials, and subjecting the same to heat. For this purpose, I prefer to employ a compound of india-rubber and sulphur, without other matters, unless it be simply colouring matters, but I do not confine myself thereto. What I believe to be the best compound for the purpose is two parts of india-rubber and one part sulphur, or, in place of sulphur, matters containing, or which will give sulphur by heat, may be employed: I prefer, however, to use sulphur. When these matters have been well kneaded or combined together, the handles of brushes may be made therefrom by moulding them in suitable metal or other moulds, and the process of conversion by heat may be carried on whilst the compound is in the moulds, or the process of heat may first be applied when the compound has been made into suitable sheets, or forms, to admit (when converted) of the handles being cut therefrom, as when making handles for brushes from ivory or bone. The stocks, or handles, of tooth, clothes, and other brushes, may be made in two parts, or halves; the lower half, or that which holds the bristles, is perforated for the brush when this part of the brush-handle is moulded, and this part is then cemented to the upper half of the handle after it has been moulded; wires, threads, or twines,

are placed between them lengthwise of the handle; these wires, threads, or twines being first so prepared that they may be readily drawn out after the brush is finished. This may be done with paper, or a coating of liquid plaster, or any other suitable material. The process of heat may be carried on by any convenient means. The compound is subjected, together with the moulds, to the heat, or, when in sheets, the same is best kept in form by sheets of iron or other material, such as glass, which will not be injured by heat. The temperature of the bath is to be raised gradually to about 230° of Fahrenheit, in about half an hour, at which heat it is desirable to retain the compound for about one and a half hour, when the heat is again to be raised gradually to 295° to 305° of Fahrenheit, say, in about four hours. The compound is to be removed from the heat, and allowed to become cold, when it is to be taken from the moulds, or from between the plates used for keeping it in form during the process of heat; the handles for brushes are then to be completed, as when using ivory or bone, and the bristles, or substitutes for bristles, are to be introduced and fixed in such handles, as when making brushes with handles of other materials.

Another part of my invention consists of manufacturing artificial bristles, or substitutes for bristles, from a compound of india-rubber and sulphur, with or without the materials, preferring, however, to employ the simple compound of india-rubber and sulphur, as I believe all other matters which have heretofore in some cases been used tend to weaken the strength and elasticity of the compound; and I believe that two parts by weight of india-rubber, and one part by weight of pure sulphur, makes the best compound. These matters having been well kneaded or combined, I cause them to be forced through fine holes in a suitable steel or other die, by which fine threads will be obtained, which are next subjected to heat as above explained, which may be conveniently done by placing the fine threads parallel, and by covering them with liquid plaster, or imbedding them in plaster. The fibres thus made, when cold, will be found strong, tough, and elastic, suitable to be used as substitutes for bristles, and they are to be introduced and fixed in proper handles, when making brushes, in like manner to bristles. In some cases, I can make substitutes for bristles by using a pair of dies, in one of which are numerous small holes, as close as may be together, and of a

depth equal to the length desired to be given to the bristles, so that by pressing the plastic compound into such moulds, the same will fill the numerous fine holes, and will also, at the same time, be attached to any form of bed or surface of the same material, according to the form of the dies, and in this state may the compound be vulcanized, or converted into hard material, by heat applied as above explained.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I make no claim to the combining india-rubber and sulphur, or to the subjecting such compounds to heat; but what I claim is, the manufacture of handles for brushes from such compounds; and I also claim the manufacture of substitutes for bristles from such compounds.—In witness, &c.

CHARLES GOODYEAR.

Specification of the Patent granted to CHARLES GOODYEAR, *of Avenue-road, St. John's Wood, in the County of Middlesex, for Improvements in Preparing India-rubber.* —Dated July 15, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of cutting india-rubber in pieces, by preference in thin slices, which are put into a washing or fulling machine, with water thickened with lime flour or other fine matter for preventing the pieces of India-rubber adhering when they are beaten, by which means some of the impurities are separated. The pieces of India-rubber are next subjected to chopping or cutting to reduce the same to a granular state, which is believed to be best done by means of machinery, similar to what is used in paper making, employing solutions of potash or lime or strong acid, which will decompose the bark and foreign matters.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

After washing the india-rubber as free as may be of any wood or impurities, which may be separable by the aid of beating in water, thickened with lime, and by cutting or chopping by a proper engine, or other means, to obtain the india-rubber in a granular or highly divided and washed

state, to which I make no claim, I proceed to act by an acid or alkaline process, preferring to resort to an alkaline process for the purpose of removing impurities. It is well known that india-rubber differs in quality very largely, and therefore it is impossible to say how much alkali or how much acid is to be used in all cases for a given weight of india-rubber, but a workman with experience will readily understand how to treat any quality of india-rubber with as little waste of alkali or acid as may be. And I would state that the alkali best suited for the purpose is potash, and the acid best suited for the purpose is sulphuric acid. When using alkali it is to be in a caustic state, and I usually employ a solution composed at the rate of one gallon of water to each pound of carbonate of potash, and I render the same caustic, as is well understood, by lime, and I use at the rate of thirty pounds of lime to each fifty pounds of carbonate of potash in solution. In this solution of caustic alkali I soak the granulated or well-divided india-rubber for some hours, which will more or less depend on its state of impurity; some very impure specimens have sometimes required forty to fifty hours to dissolve or remove the impurities; a workman, however, will after some practice readily ascertain when the desired result is obtained. The india-rubber is then to be well washed to remove any alkali, after which the india-rubber is to be kneaded or masticated in the ordinary manner. If acid be used, the india-rubber is to be similarly soaked in a solution thereof, for which purpose I prefer to employ, at the rate of one pound of sulphuric acid of commerce to one gallon of water, and the soaking and subsequent washing and kneading or masticating are to be performed as above directed.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that what I claim is, the subjecting india-rubber in a divided state to an alkaline or acid process to cleanse the same of impurities.—In witness, &c.

CHARLES GOODYEAR.

Specification of the Patent granted to JAMES CHILDS, *of Gilston-road, Brompton, in the County of Middlesex, Gentleman, for Improvements in the Manufacture of Materials to render them Suitable as Substitutes for Millboard and such like uses.*—Dated September 9, 1853.

To all to whom these presents shall come, &c., &c.—It is well known that in making different descriptions of boxes, that comparatively thin sheets of wood, coated with paper on each side in some cases, and only on one side in other cases, have been extensively used, and the same is known as scale-board, and it has been lately proposed to use such like material as substitutes for the cards employed in jacquard weaving, but in such cases the wood, though comparatively thin, has been too thick to admit of two or more thicknesses with several thicknesses of paper, in order to make a composite board and yet retain such a degree of thinness as is desired, and the wood so heretofore used has not been subjected to processes to act on the grain in a manner to interfere with the texture of the grain to take away the tendency to bend, and to give it, when combined with suitable cement, better holding properties in regard to the paper.

This invention consists of using very thin sheets of wood, preferring them to be of not greater thickness than eighty to the inch, and combining them with sheets of paper or fibrous materials by cement, the thickness of paper in some cases being thicker than the wood. The wood in some instances is perforated with numerous holes, and the grain in the succeeding sheets is placed in different directions. The cemented sheets are also, when desired, submitted to considerable pressure. The wood is boiled in or submitted to solutions of size or other matters to give adhesion and other properties, according to the nature of the solution employed.

Having thus stated the nature of my said invention I will proceed to describe the manner of performing the same.

The descriptions of wood which I employ for the purposes of my invention are such as have heretofore been used in making scaleboard, but I cause them to be cut much thinner than what has heretofore been the practice, and I

prefer to employ thin shavings cut to about one hundred and forty to the inch, though I do not confine myself thereto, as a somewhat greater or less thickness may be used in carrying out my invention. The means of cutting such thin sheets or shavings of wood are the same as those heretofore employed only set to cut finer. It is found that thin sheets or shavings of wood have often a tendency to bend in one direction when subjected to different states of atmosphere, and it is desirable that this tendency should be prevented in the single and separate sheets, and this may be done by puncturing them with numerous fine points or by lines of fine indents, and this treatment of thin sheets or shavings of wood aids also in giving more holding of the cement used to the wood and paper. The most convenient means of puncturing the wood I believe to be by having one roller with its periphery covered very closely with very small projecting points, and a second roller covered with vulcanized india-rubber or other matter, which will admit of the points coming in contact with it and to pass the sheets of wood through between such rollers, or in place of fine points numerous parallel fine edges may be used, or in place of rollers a like effect may be obtained to the wood by having points or parallel edges fixed on a flat pressing surface, and I have also found it desirable to subject the surfaces of the wood to the action of an acid or alkali. The acids are used to effect the separation of moisture from and harden the woody fibre and the cellular tissue, and thus arrest the power which wood retains so long, of absorbing and giving out moisture. I use at the rate of about two per cent. of sulphuric acid to the water employed, and I dip the sheets or shavings of wood for about ten minutes. Alkalies are used to partially decompose the woody fibre and thus soften the surface so that it bends more readily and does not shrink and warp as wood unprepared does. I use an alkaline ley specific gravity 1·16 to 1·21, or 20 to 25 degrees of the hydrometer of Baumè, dip the sheets for about half an hour in the solution at 140 degrees Fahrenheit, and afterwards dip them in water to wash off the adhering ley, then dry them, and when dry dip them, if desired, in glue and water (20 lbs. to 100 lbs. of water), then dry and coat them with paper as described.

I would state that very good results may be obtained without subjecting the wood to the processes above described,

but the best qualities of my composite boards may I b
be obtained by subjecting the wood to one or other of
and I prefer the puncturing process. And I prefer
on the sheets of wood after one side has been coated
paper and dried and pressed, and then in compara
long parts more than one sheet may be perforated a
time, but when using a roller with points on its s
I believe it better to have the points very short and
suited to puncture one sheet at a time. Before coatin
wood with paper I prefer to saturate the wood wit
adhesive matter, such as gelatine (ordinary size), t
gum, paste, or resinous matters may be used. Fo
purpose I use size, and I keep the same heated to
190 degrees of Fahrenheit, and I immerse the she
shavings therein for about a quarter of an hour or mor
then hang them on a line to dry preferring for this pur
well ventilated room kept at about 60 or 70 degrees o
renheit, and then press them. If glue be used f
cementing between the paper and the wood it m
laid on with a brush as is now done in the manuf
of pasteboard, or a quantity may be mixed in a suitab
or trough, and the wood dipped into it for about a m
or more if paper has been applied. The solution of
prefer is at the rate of 20 lbs. of glue to 100 l
water, 2 lbs. of treacle, and two ounces of alum. The
of sheets or shavings of wood depend on the sizes of
of the composite board which is to be made, and
sheets or shavings of wood accordingly, and in maki
a composite board I lay two widths of board edge t
and coat it with a sheet of paper and then lay on two
sheets or shavings of wood so as to cross the gr
the previous ones, then another coating of paper, and
till the desired thickness of composite board has
obtained, and several such composite boards are
subjected to pressure by which the excess of cem
material will be expressed from the several boards, a
same are to be separated and dried, as is well under
in drying pasteboard. The composite boards are
when desired, to be subjected to pressure between sh
metal. I would state that in place of using glue, p
resinous cements may be employed.

Having thus described the nature of my said inv
and the manner of performing the same, I would stat
I do not confine myself to the details.

But what I claim is, the manufacture of what I have called composite boards as herein described.—In witness, &c.

JAMES CHILDS.

PATENTS SEALED TO APRIL 24, 1854.

47. RICHARD ALBERT TILGHMAN, of Philadelphia, America, Chemist, for Improvements in railway switches and chairs.—Dated January 9, 1854. Sealed March 25, 1854.

58. ALEXANDER MITCHELL, of Belfast, for Improvements in propelling vessels.—Dated January 10, 1854. Sealed March 25, 1854.

120. WILLIAM THOMAS, of Cheapside, for Improvements in stays. —Dated January 19, 1854. Sealed March 25, 1854.

155. CHARLES JOHN EDWARDS, of Great Sutton-street, Middlesex, Leather Hose and Band Manufacturer, for Improvements in the manufacture of bands for driving machinery.—Dated January 21, 1854. Sealed March 25, 1854.

160. THOMAS ROBINSON, of Farringdon-street, for Improvements in apparatus for filtering volatile liquids.—Dated January 23, 1854. Sealed March 25, 1854.

182. SAMUEL CUNLIFFE LISTER, of Manningham, Manufacturer, for Improvements in combing wool, cotton, and other fibrous materials.—Dated January 24, 1854. Sealed March 25, 1854.

227. JOHN KERSHAW, of Dublin, Engineer, for Improvements in steam-engines.—Dated January 30, 1854. Sealed March 25, 1854.

265. JOHN HAMILTON GLASSFORD, of Glasgow, Lithographer, for Improvements in lithographic and zincographic printing.—Dated February 2, 1854. Sealed March 25, 1854.

2231. FRANÇOIS JULIEN RAUX, of Montmartre, France, Engineer, for Improvements in railway breaks.—Dated September 29, 1853. Sealed March 29, 1854.

2237. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Gentleman, for Improvements in apparatus for throwing out ropes or lines for the better preservation of life and property.—Dated September 30, 1853. Sealed March 29, 1854.—(A communication.)

2277. SAMUEL LEAKE WORTH, of Oxford-street, Middlesex, Brush Maker, and AGMOND DISHIN VESEY CANAVAN, of Fitzroy-street, Middlesex, for An improved polishing and brightening surface. —Dated October 5, 1853. Sealed March 29, 1854.

2309. WILLIAM POTTS, of Birmingham, for Improvements in mantel-pieces.—Dated October 8, 1853. Sealed March 29, 1854.

2366. ANDREW MCLEAN, of Edinburgh, Chemist, and WILLIAM FRASER RAE, of the same place, Brassfounder, for Improvements in apparatus for the manufacture of ærated liquids.—Dated October 14, 1853. Sealed March 29, 1854.

2380. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, London, for Certain improvements in the treatment of copper ores.—Dated October 15, 1853. Sealed March 29, 1854.—(A communication.)

2404. EMORY RIDER, of Coleman-street, London, Manufa
for Improvements in the manufacture or treatment of gutta p
—Dated July 20, 1853. Sealed March 29, 1854.

2408. JOHN WRIGHT CHILD, of Halifax, in the county of
and ROBERT WILSON, of Low Moor Iron Works, in the same c
Engineers, for Improvements in regulating motive power engi
Dated October 19, 1853. Sealed March 29, 1854.

2457. JEAN BAPTISTE VERDUN, of Paris, Gentleman, for Im
ments in the construction of globes. — Dated October 25,
Sealed March 29, 1854.

2527. HENRY TYLOR, of Queen-street, London, Manufactu
An improved chair bedstead.—Dated November 1, 1853.
March 29, 1854.

2771. JOHN CARTER RAMSDEN, of Bradford, York, Stuff
facturer, for Improvements in apparatus for the mechanism of
for weaving a certain class of plaids, checks, and fancy woven
—Dated November 28, 1853. Sealed March 29, 1854.

8. HENRY LEE CORLETT, of Dublin, Gentleman, for Improv
in caoutchouc springs for locomotive engines and tenders,
carriages, and waggons.—Dated January 3, 1854. Sealed Ma
1854.

150. CYPRIEN MARIE TESSIE DU MOTAY, Chemist, of Pa
Improvements in the manufacture of oil from rosin.—Dated J
21, 1854. Sealed March 29, 1854.

193. THOMAS WICKSTEED, of Leicester, Civil Engineer,
provements in the manufacture of sewage manure.—Dated J
26, 1854. Sealed March 29, 1854.

215. DONALD BETHUNE, of Toronto, Canada West, for I
ments in the construction of vessels propelled by steam
motive power.—Dated January 28, 1854. Sealed March 29,

245. JAMES JACKSON, of Broad-street, Golden-square, Mi
and GEORGE MORRIS HANTLER, of Sloane-street, Middlesex,
provements in baths.—Dated January 31, 1854. Sealed Ma
1854.

302. JAMES TAYLOR, of Carlisle, Engineer, ISAAC BROWN,
place, Merchant and Field Seedsman, and JOHN BROWN, of
street, Middlesex, Silk Mercer, for Improvements in the cha
vegetable and animal substances.—Dated February 7, 1854.
March 29, 1854.

2244. EDWARD DAVIES, of Bradford, York, Machine Ma
improvements in carrier-combs to be used in combing wool,
silk, flax, or other fibrous substances.—Dated October 1, 1853.
April 1, 1854.

2255. WILLIAM JOSEPH THOMPSON, of North Shields,
Vice-Consul, for Improvements in heating reverberatory an
furnaces.—Dated October 3, 1853. Sealed April 1, 1854.—
munication.)

2273. JOHN WRIGHT, of Rochester, Kent, Civil Engineer,
provements in apparatus to facilitate the landing and emba
passengers from steam-boats and other vessels.—Dated Oc
1853. Sealed April 1, 1854.

2304. HENRY KRAUT, of Zurich, Engineer, for Improven
stands for casks and barrels.—Dated October 8, 1853.
April 1, 1854.

194. THOMAS WICKSTEED, of Leicester, Civil Engineer, for Improvements in the manufacture of sewage manure.—Dated January 26, 1854. Sealed April 1, 1854.

2274. JAMES THOMSON WILSON, of Falkirk, North Britain, for Improvements in the manufacture of alum.—Dated October 5, 1853. Sealed April 4, 1854.

2279. JOHN MASON, of Rochdale, Lancaster, Machinist, for Improvements in preparing cotton for spinning, and in machinery or apparatus for effecting the same.—Dated October 5, 1853. Sealed April 4, 1854.

2282. JULIUS SCHONEMANN, of Great Portland-street, Middlesex, for New constructions of weighing machines.—Dated October 6, 1853. Sealed April 4, 1854. (A communication.)

2780. JAMES ALEXANDER MANNING, of the Inner Temple, Middlesex, Esquire, for Improvements in the treatment of sewerage and other polluted liquids, and the products thereof.—Dated November 29 1853. Sealed April 4, 1854.

3022. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for Improvements in the manufacture of screws.—Dated December 29, 1853. Sealed April 4, 1854. (A communication.)

10. DAVID KENNEDY, of Reading, Pennsylvania, America, Manufacturer of Leather, for the Use of tanners, being certain compositions of matter to be used in the manufacture of leather.—Dated January 3, 1854. Sealed April 4, 1854.

38. WILLIAM EDWARD NEWTON, of Chancery-lane, Middlesex, Civil Engineer, for Improved machinery for dyeing, washing, and bleaching fabrics.—Dated January 7, 1854. Sealed April 4, 1854. (A communication.)

142. ROBERT ANGUS SMITH, of Manchester, Doctor of Philosophy, and ALEXANDER M'DOUGALL, of the same place, Manufacturing Chemist, for Improvements in treating deodorizing and disinfecting sewage, and other offensive matter, which said improvements are also applicable to deodorizing and disinfecting in general.—Dated January 20, 1854. Sealed April 4, 1854.

166. JOHN GETTY, of Liverpool, Ship Builder, for Improvements in the manufacture of tubular bridges, part of which improvements is applicable also to the preparation of plates for covering iron ships, for constructing boilers, and for analogous uses.—Dated January 23, 1854. Sealed April 4, 1854.

186. WILLIAM EDWARD NEWTON, of Chancery-lane, Middlesex, Civil Engineer, for An improvement in violins, and other similar stringed musical instruments.—Dated January 25, 1854. Sealed April 4, 1854. (A communication.)

2275. HENRY JOHN BETJEMANN, of New Oxford-street, Middlesex, for Improvements in apparatus for fixing capsules on the necks of bottles and other vessels.—Dated October 5, 1853. Sealed April 5, 1854.

2296. JOSEPH PORTER, of the Salford Screw Bolt Works, Lancaster, Engineer and Tool Maker, for Improvements in machines for drilling or boring metals or other substances.—Dated October 7, 1853. Sealed April 7, 1854.

2299. JOSEPH LAMBERT, of Short-street, New Cut, Lambeth,

Surrey, Brass Founder, for Improvements in ships' water cl
Dated October 7, 1853. Sealed April 7, 1854.

2347. JAMES HIGGINS, of Salford, Machine Maker, and
SCHOFIELD WHITWORTH, of same place, Mechanic, for Impro
in machinery or apparatus for spinning and doubling fibrou
rials.—Dated October 12, 1853. Sealed April 7, 1854.

2372. The HON. FREDERICK WILLIAM CADOGAN, of H
street, May Fair, Middlesex, for Improvements in the m
obtaining telegraphic communications applicable to armies
field.—Dated October 14, 1853. Sealed April 7, 1854.

2373. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castl
Holborn, London, for Improvements in drying grain, flour,
fruit, vegetables, and other substances.—Dated October 1
Sealed April 7, 1854.—(A communication.)

2376. FREDERICK SAMSON THOMAS, of Cornhill, London,
man, for Improvements in the construction of railway carr
Dated October 15, 1853. Sealed April 7, 1854.

2409. JOHN NORTON, of Cork, Ireland, Esquire, for Impro
in fire-arms.—Dated October 19, 1853. Sealed April 7, 1854.

2415. JAMES BARTON, of Robert-street, Hampstead-road,
sex, Ironmonger, for Improvements in fittings for stables.-
October 19, 1853. Sealed April 7, 1854.

2427. WILLIAM MELVILLE, of Burntisland, Fife, North
Tailor, for improvements in apparatus for drawing ships out o
—Dated October 20, 1853. Sealed April 7, 1854.

2449. THOMAS STAINTON, of South Shields, Cast Iron an
Founder, for improvements in steering apparatus.—Dated
24, 1853. Sealed April 7, 1854.

2578. EDWIN KESTERTON, of Long Acre, Middlesex, C
Builder, for Improvements in springs for carriages.—Dated No
5, 1853. Sealed April 7, 1854.

2592. GEORGE FREDERICK PARRATT, of Victoria-street, I
for improvements in life rafts.—Dated November 8, 1853.
April 7, 1854.

2761. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castl
Holborn, London, for Certain improvements in straining mill
Dated November 26, 1853. Sealed April 7, 1854. (A communi

2834. WILLIAM EDWARD GAINE, of Harewood-street, Ha
square, for An improvement in treating or preparing paper.-
December 6, 1853. Sealed April 7, 1854.

2956. JOSIAH LATIMER CLARK, of Chester Villas, Canonbur
South, Islington, for An improvement in insulating wire u
electric telegraphs, with a view to obviate the effects of re
inductive currents.—Dated December 20, 1853. Sealed April 7

40. JESSE ROSS, of Keighley, York, Gentleman, for Improv
in making compounds of chocolate, cocoa, and other ingredie
breakfast and occasional beverages.—Dated January 7, 1854.
April 7, 1854.

88. ARTHUR PARSEY, of Crescent-place, Burton-crescen
Pancras, Middlesex, for Improvements in machinery for ob
and applying motive power by means of compressed air and
fluids. Dated January 13, 1854. Sealed April 7, 1854.

158. WILLIAM DARLING, of Edinburgh, Merchant, for Im

ments in sewing machines.—Dated January 23, 1854. Sealed April 7, 1854. (A communication.)

198. SAMUEL SLACK STALLARD, of York-street, Welford, Leicester, for Improvements in the manufacture of knit fabrics.—Dated January 26, 1854. Sealed April 7, 1854.

212. JOSIAH LATIMER CLARK, of Chester Villas, Canonbury Park, Islington, Middlesex, for Improvements in apparatus for conveying letters or parcels between places by the pressure of air and vacuum.—Dated January 28, 1854. Sealed April 7, 1854.

226. RICHARD GARRETT, of Leiston Works, Suffolk, for Improvements in thrashing machines.—Dated January 30, 1854. Sealed April 7, 1854.

252. FRANCIS HERBERT WENHAM, of Effra Vale Lodge, Brixton, Engineer, for Improvements in fire-arms.—Dated February 1, 1854. Sealed April 7, 1854.

269. CHARLES HASTINGS COLLETTE, of Lincoln's Inn Fields, Middlesex, Gentleman, for An improved method of reducing ores.—Dated February 3, 1854. Sealed April 7, 1854.

278. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for Improvements in springs applicable to railway carriages and other uses.—Dated February 4, 1854. Sealed April 7, 1854. (A communication.)

339. JOHN ROGERS, Manufacturer, of New York, America, for the preparation of asphaltum, coal, tar, resin, resin oil, naphtha, and turpentines, for the manufacture of lamp-black.—Dated February 11, 1854. Sealed April 7, 1854.

2329. JAMES WORRALL, of Salford, Dyer and Finisher, for Certain improvements in the method of dyeing fustians and other textile fabrics, and in the machinery or apparatus connected therewith.—Dated October 11, 1853. Sealed April 11, 1854.

2330. CHARLES ROWLEY, of Birmingham, for Improvements in ornamental dress fastenings.—Dated October 11, 1853. Sealed April 11, 1854.

2336. JOHN FRANCIS PORTER, of Bessborough Street, Middlesex, Civil Engineer, for Improvements in the moulding of bricks and other articles of like materials.—Dated October 11, 1853. Sealed April 11, 1854.

2338. GEORGE FREDERICK GOBLE, of Fish-street, London, Civil Engineer, for Improvements in apparatus for signalizing and stopping railway trains.—Dated October 12, 1853. Sealed April 11, 1854.

2339. JOHN MORISON and DANIEL HURN, both of Norton Folgate, for Improvements in the manufacture of nose-bags.—Dated October 12, 1853. Sealed April 11, 1854.

2343. EDME JULES MAUMENE, of Reims, Professor of Chemistry, for Improvements in the treatment of lignite or wood coal, and in obtaining various useful products therefrom.—Dated October 12, 1853. Sealed April 11, 1854.

2344. ROBERT WILLIAM WAITHMAN, of Bentham House, York, Gentleman, for Improvements in apparatus for applying paint, varnish, and other liquid substances, and also for cleaning carriages, ships, roadways, houses, and other buildings.—Dated October 12, 1853. Sealed April 11, 1854.

2346. GEORGE BRADLEY, of Castleford, York, Gentleman, for

Improvements in stoppers or covers for bottles, and in the apparatus for manufacturing the same.—Dated October 1 Sealed April 11, 1854.

2395. JOHN PALMER DE LA FONS, of Carlton Hill, St Wood, Middlesex, Gentleman, for Improvements in appar measuring and indicating the distance travelled by a carriage. October 17, 1853. Sealed April 11, 1854.

2461. JOSEPH BEASLEY, of Smethwick, Iron Master, for I ments in the construction and arrangement of puddling which improvements are also applicable to other furnaces use generation of steam.—Dated October 25, 1853. Sealed April

2608. SOLOMON STURM, of Carpenter's-buildings, London, for Machinery for the manufacture of optical lenses.—Dated ber 11, 1853. Sealed April 11, 1854.

208. JOSEPH ATKINSON, of Richmond Grove, Middlesex, E for Improvements in thrashing-machinery.—Dated January 2 Sealed April 11, 1854.

231. ARNOLD MOREL FATIO, Merchant, and FRANÇOIS V Medical Doctor and Chemist, both of Paris, for Improven preserving animal and vegetable substances.—Dated January Sealed April 11, 1854.

295. JOHN ELCE, of Manchester, Machine Maker, for Cer provements in machinery for spinning cotton and other materials.—Dated February 7, 1854. Sealed April 11, 1854.

332. WILLIAM WHITELEY, of Lockwood, near Huddersfiel Dresser, for Improvements in machinery or apparatus for tent stretching woollen and other fabrics.—Dated February 1 Sealed April 11, 1854.

393. EDWARD LOYSEL, of Paris, Civil Engineer, for Impro in apparatus for obtaining infusions or extracts from various su —Dated February 18, 1854. Sealed April 11, 1854.

460. FREDERICK WILLIAM ALEXANDRE DE FABECK, of street, Strand, Middlesex, for The construction of bridges, lintels, beams, girders, and other horizontal structures and —Dated February 25, 1854. Sealed April 11, 1854.

2357.—Sir JOHN SCOTT LILLIE, of South-street, Finsb Improvements in machinery for breaking stones and other h stances.—Dated October 13, 1853. Sealed April 13, 1854.

2368. MARY ANN DAVY, of Homerton, and ANN TAY Islington, for Improvements in the mechanical application of Dated October 14, 1853. Sealed April 13, 1854.

2369. WILLIAM PALMER, of Brighton, ironmonger, for improvements in ventilating.—Dated October 14, 1853. April 13, 1854.

2378. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Ge for Improvements in the manufacture of iron.—Dated Oct 1853. Sealed April 13, 1854.—(A communication.)

2379. BUCKLEY ROYLE, of Manchester, Manufacturer, and M'EWAN CHELL, of same city, Salesman, for A certain m treating silk waste arising from winding, warping, and weav and rendering it capable of being spun or otherwise employed October 15, 1853. Sealed April 13, 1854.

2384. ALEXANDER M'DOUGALL, of Manchester, Manuf

Chemist, for Improvements in the process of obtaining fatty matters from products arising in the manufacture of glue and other gelatinous substances.—Dated October 15, 1853. Sealed April 13, 1854.

2390. JOHN MACMILLAN DUNLOP, of Manchester, Engineer, for Improvements in machinery or apparatus for pressing goods, applicable also to raising or removing bodies.—Dated October 17, 1853. Sealed April 13, 1854.

2419. WILLIAM BINNS, of Leeds, Cloth-dresser, for An improvement in the treatment or finishing of woollen and worsted fabrics.—Dated October 19, 1853. Sealed April 13, 1854.

2428. JONATHAN WOOFINDEN, of Belfast, Engineer, for Improvements in power-looms for weaving.—Dated October 20, 1853. Sealed April 13, 1854.

2528. JAMES CHESTERMAN, of Sheffield, Machinist, for Improvements in hardening and tempering steel, and in grinding, glazing, buffing, and brushing steel and other metallic articles.—Dated November 1, 1853. Sealed April 13, 1854.

2563. WILLIAM RACKSTER, of the Royal Military Academy, Woolwich, Mathematical Master, for Improvements in the construction and arrangement of the buffing apparatus of railway carriages, and in the mode of applying the buffer and draw springs to such carriages.—Dated November 4, 1853. Sealed April 13, 1854.

2867. FREDERICK OSBOURN, of Aldersgate-street, London, Tailor, for Improvements applicable to the distribution of manure.—Dated December 9, 1853. Sealed April 13, 1854.

2900. BENJAMIN FULLWOOD, of No. 23, Abbey-street, Bermondsey, Manufacturing Chemist, for Certain improvements in the manufacture of cement.—Dated December 14, 1853. Sealed April 13, 1854.

70. MARCEL VETILLART, of Le Mans, France, for Improvements in drying woven fabrics, yarns, and other goods.—Dated January 11, 1854. Sealed April 13, 1854.

197. SYDNEY SMITH, of Hyson-green Works, near Nottingham, for Improvements in valves or apparatus for regulating the passage and supply of fluids.—Dated January 26, 1854. Sealed April 13, 1854.

206. WILLIAM PALMER, of Brighton, for Improvements in the manufacture of materials for and in constructing houses and other buildings.—Dated January 27, 1854. Sealed April 13, 1854.

253. ALBERT ROBINSON, of Whitehall-place, for Improvements in preparing compositions for coating iron and other ships' bottoms, and other surfaces.—Dated February 1, 1854. Sealed April 13, 1854.

264. JAMES STEVENS, of Darlington Works, Southwark-bridge-road, for Improvements in apparatus for giving railway signals.—Dated February 2, 1854. Sealed April 13, 1854.

268. THOMAS and WILLIAM HEMSLEY, of Melbourne, Derby, Lace Manufacturers, for Improvements in the manufacture of looped fabrics.—Dated February 6, 1854. Sealed April 13, 1854.

296. EDWARD POITIERS, of Malden-terrace, Haverstock-hill, Middlesex, Gentleman, for A new material for the manufacture of cordage, canvas, and linen, and generally as a substitute for hemp and flax.—Dated February 7, 1854. Sealed April 13, 1854.

301. ABRAHAM POPE, of Edgware-road, Middlesex, for Improvements in machinery for crushing, grinding, amalgamating, and washing quartz or matters containing gold.—Dated February 7, 1854. Sealed April 13, 1854.

327. JACQUES RIVES, of Hotel Motay, Rue Motay, Paris, for Improvements in railways and railway-carriages.—Dated February 10, 1854. Sealed April 13, 1854.

347. JAMES COX, of Wenlock-road, City-road, Middlesex, Engineer and Manufacturer of Paper-cutting Machines, for Improvements in knives for cutting paper and other materials.—Dated February 13, 1854. Sealed April 13, 1854.

350. JOHN GREENWOOD, of Irwell-springs, near Bacup, Lancaster, Turkey-red Dyer, for Certain improvements in dyeing textile materials or fabrics.—Dated February 13, 1854. Sealed April 13, 1854.

390. WILLIAM MORRISON, of Bowling, Dumbarton, N.B., Engineer, for Improvements in railway wheels.—Dated February 18, 1854. Sealed April 13, 1854.

2399. GEORGE LOUIS STOCKS, of Limehouse Hole, Poplar, Middlesex, Ship Chandler, for Improvements in ships' jackstays for masts, and gaffs for fore and aft sails.—Dated October 18, 1853. Sealed April 18, 1854.

2401. ALPHONSE DOSTE NOEL, of Chancery-lane, Middlesex, French Advocate, for Improvements in the manufacture of zinc white. —Dated October 18, 1853. Sealed April 18, 1854. (A communication.)

2403. CORNELIUS NICHOLSON, of New Broad-street, Middlesex, Esquire, Superintendent Director of the Great Indian Peninsular Railway Company, for An apparatus for avoiding collisions of trains on railways.—Dated October 18, 1853. Sealed April 18, 1854.

2558. JAMES SCOTT, of Shrewsbury, Carriage and Waggon Inspector of the Shrewsbury and Birmingham Railway Company, for An improved apparatus for shifting carriages, waggons, engines, and other vehicles on railways and tramways.—Dated November 4, 1853. Sealed April 18, 1854.

55. The Rev. WILLIAM RENWICK POWDITCH, of Wakefield, York, Clerk, Bachelor of Arts, for Improvements in economising fuel, and in the more economical production of light and heat.—Dated January 10, 1854. Sealed April 18, 1854.

2410. WILLIAM ROY, of Cross Arthurlie, Renfrew, N.B., Calico Printer, for Improvements in printing textile fabrics and other surfaces. —Dated October 19, 1853. Sealed April 19, 1854.

2431. CHRISTOPHER CROSS, of Farnworth, Lancaster, Manufacturer, and JAMES CROSBY, of Manchester, Manufacturer, for Improvements in machinery or apparatus for weaving.—Dated October 21, 1853. Sealed April 21, 1854.

2434. CHARLES NICHOLAS MICHEL and AUGUSTE LECOMTE, of Paris, for Certain improvements in windows.—Dated October 21, 1853. Sealed April 21, 1854.

2435. JEAN FRANÇOIS FELIX CHALLERTON, of Paris, for Certain improvements in carbonizing and distilling peat, coal, wood, and other animal, vegetable, and mineral substances.—Dated October 21, 1853. Sealed April 21, 1854.

2441. HARRY BENTLEY, of Salford, Roller and Spindle Maker

and Millwright, for Improvements in steam boilers, and in the method of setting or fixing the same.—Dated October 22, 1853. Sealed April 21, 1854.

2448. HENRY KRAUT, of Zurich, Engineer, for Improvements in apparatus for regulating the temperature of stoves and furnaces, and of water, air, or other fluids contained in vessels or chambers, the strength of spirituous liquors and of chemical mixtures, and the hygrometric state of the air in buildings, rooms, &c.—Dated October 24, 1853. Sealed April 21, 1854.

2452. EDWARD JOHN MONTAGU ARCHDEACON, of Gravel-lane, Southwark, for An improved method of indicating places, divisions, or contents in directories.—Dated October 24, 1853. Sealed April 21, 1854.

2493. JOSEPH GURNEY, of St. James-street, Westminster, Tailor, for An improved mode of treating waterproof fabrics.—Dated October 27, 1853. Sealed April 21, 1854.

2541. FREDERICK LIPSCOMBE, of the Strand, Water Filter Manufacturer, for Improvements in obtaining steam power and in regulating the same.—Dated November 2, 1853. Sealed April 21, 1854.

2547. PETER M'GREGOR, of Manchester, Machine Maker, for Improvements in machinery for spinning and doubling.—Dated November 3, 1853. Sealed April 21, 1854.

2695. EMANUEL WHARTON, of Birmingham, Engineer, for Improvements in the manufacture of railway wheels.—Dated November 19, 1853. Sealed April 21, 1854.

2703. ROBERT JAMIESON SIBBALD, of Paddington, Edge Hill, West Derby, Surgeon, for An improved mode of communicating from vessels to the shore or from one vessel to another.—Dated November 21, 1853. Sealed April 21, 1854.

2731. JAMES LOVELL, of Glasgow, Gentleman, for Improvements in the application of heat to various useful purposes.—Dated November 24, 1853. Sealed April 21, 1854.

2741. ALEXANDRE ANDRE VICTOR SARRAZIN DE MONTFERRIER, of Paris, Gentleman, for Improvements in wheels for vehicles on common roads and railways.—Dated November 25, 1853. Sealed April 21, 1854.

2817. JOHN GWYNNE, and JAMES EGLESON ANDERSON GWYNNE, of Essex Wharf, Strand, Middlesex, for Improvements in the manufacture of fuel, its preparation and applications for the reduction of ores, fusing and refining metals, cementation or making steel, and treating salts.—Dated December 3, 1853. Sealed April 21, 1854. —(Partly a communication.)

109. HENRY HOLLAND, of Birmingham, Umbrella and Parasol Manufacturer, for Certain improvements in the construction of parts of umbrellas and parasols.—Dated January 17, 1854. Sealed April 21, 1854.

257. JAMES HARGREAVES, Cotton Spinner, and JAMES FLETCHER, Manager, both of Facit, near Rochdale, Lancaster, for Certain improvements in machinery for preparing to be spun cotton and other fibrous materials.—Dated February 2, 1854. Sealed April 21, 1854.

319. JOHN TAGGART, of the State of Massachusetts, Ameri
An improved machine for excavating earth.—Dated February 9,
Sealed April 21, 1854.

359. ARTHUR JONSON, of Mitcham, in the county of Surr
Improvements in preparing barley and grits or groats.—Date
ruary 14, 1854. Sealed April 21, 1854.

369. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall,
aging Director of Price's Patent Candle Company, for Improv
in preparing an oil, and in the manufacture of candles and
lights.—Dated February 15, 1854. Sealed April 21, 1854.

377. GEORGE FERGUSSON WILSON, of Belmont, Vauxhall,
aging Director of Price's Patent Candle Company, for An in
ment in the manufacture of lubricating matters.—Dated Febru
1854. Sealed April 21, 1854.

385. JOSEPH HINCHLIFFE, of Dam Side, near Halifax,
Cotton Spinner, for Certain improvements in machinery or ap
for manufacturing bricks and tiles.—Dated February 17, 1854.
April 21, 1854.

401. JOHN CHISHOLM, of Holloway, Middlesex, Chemist, f
provements in the purification of gas.—Dated February 20,
Sealed April 21, 1854.

403. HARVEY HILLIARD, of Glasgow, Cutler, for Improv
in apparatus for cleaning and sharpening table cutlery.—Date
ruary 20, 1854. Sealed April 21, 1854.

405. WILLIAM MILNER, of Liverpool, Fire-proof Safe M
turer, for Certain improvements in locks for safes, which said im
ments are applicable to locks in general.—Dated February 2
Sealed April 21, 1854.

407. JOHN URIE, of Glasgow, Photographic Artist, for Im
ments in photographic pictures.—Dated February 20, 1854.
April 21, 1854.

409. FREDERICK OSBOURN, of Alderagate-street, London,
for Certain improvements applicable to the cutting out of ga
—Dated February 21, 1854. Sealed April 21, 1854.

441. PETER FAIRBAIRN, of Leeds, for A certain improve
machinery for winding slivers of flax, tow, or other vegetable
materials into laps or balls.—Dated February 25, 1854. Seale
21, 1854.

423. WILLIAM CHARLES THEODOR SCHAEFFER, of Stanh
race, Hyde Park-gardens, Middlesex, Analytical Chemist,
improved mode of recovering the fatty matters contained i
waters of woollen mills.—Dated February 21, 1854. Sealed A
1854.

2451. CHARLES BREWSTER, of Dunmow, Essex, for Improv
in printing machinery.—Dated October 24, 1853. Sealed A
1854—(A communication.)

THE

REPERTORY

OF

PATENT INVENTIONS.

No. 6. Vol. XXIII. ENLARGED SERIES.—JUNE, 1854.

Specification of the Patent granted to the Hon. Frederick William Cadogan, *of Hertford-street, May-fair, in the County of Middlesex, for Improvements in the Means of Obtaining Telegraphic Communications applicable to Armies in the Field.*—Dated October 14, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—For this purpose a carriage is employed, divided into compartments; one compartment is fitted with shelves and recesses, to contain batteries and apparatus suitable for obtaining electric currents. The other compartment of the carriage is fitted with a table, on which the electric telegraphic apparatus, or instrument, is fixed, and there are seats for the persons communicating or receiving information. The upper part of this compartment may be arranged to open in its centre, and fall back, on either side. There are rollers, having insulated wire wound thereon, such rollers being intended to be mounted on brackets, or bearings, in or outside of the carriage, when the wire is to be run out therefrom. To one end of the axle of the roller a small cog-

wheel is fixed, which is suitable for gearing with a co
or with a screw, worked by a crank-handle. Or oth
ing may be employed for giving motion to the barrel c
or motion may be given to the barrel or roller by its
communication with one of the wheels of the carria
moved by it. The insulated wire will be taken ir
off the barrel or cylinder, according to the direction i
it is turned. There is attached to the carriage a l
mortar, or other suitable apparatus for throwing an i
wire across a river, or other inland water.

Description of the Drawings.

Fig. 1, shows a longitudinal section;
Fig. 2, a side elevation; and
Fig. 3, a plan in section of a carriage constructed
ing to my invention; *a*, a^1, is the body of the
formed into two compartments; the cover, *b*, over th
compartment being hinged to the sides of the carria
to be capable of being opened and fixed, at an
reflect light to the interior of the carriage when
the under surface of the cover being furnished w
suitably reflecting surface for that purpose. The c
ment, *a*, is fitted with shelves, or recesses, *c*, *c*, for
ing the batteries or other apparatus suitable for o
electric currents; *d*, is a roller, upon which the i
wire is wound, and from which it is run off when in
end of the roller, *d*, is formed with a square, which
a square socket formed in the axis, *e*, which is supp
bearings affixed to one side of the carriage, the othe
the roller turning freely in a bearing fixed to the ot
of the carriage. When it is desired to take in the w
the roller, *d*, the clutch, e^1, (which slides on a feath
axis, *e*,) must be moved into gear by the lever, *f*,
clutch formed on the boss of the toothed pinion, *g*; an
may then be given to the pinion and roller, *g*, by the
ant turning the handle on the toothed wheel, *h*, whi
on a stud, fixed to the side of the carriage; *i*, is
lever, to control the motion of the roller when gi
the wire; d^*, d^*, are guide rollers, over which the i
wire is conducted; d^1, d^2, are additional rollers, pl
convenience, in the compartment, a^1, having insula
wound thereon, to be used, if necessary, when the w
run off the roller, *d*; *j*, is a table, for supporting any
indicating apparatus; *k*, *k*, are seats for attendants

a Manby's mortar, placed on the fore part of the carriage, or any other convenient position, for the purpose of throwing an insulated wire across a river, or elsewhere. The apparatus connected with the carriage may also be employed for firing trains, or other similar purposes, by the electric or galvanic apparatus described. When using this apparatus in the field a connexion is made with the earth, or with water, as is well understood. The end of the insulated wire is to be carried to the locality where another telegraphic instrument is to be situated, where there is also a communication made with the earth, and the distant instruments are to be connected to the insulated or circuit wire and with the earth, as is well understood, so as to produce an electric circuit.

I would state, that either galvanic batteries or electro-magneto apparatus may be used for obtaining the requisite electric currents.

I would state that, although I prefer to use the earth as part of the circuit, I do not confine myself thereto, as the circuit may be wholly of wire, properly insulated, as is well understood.

In using the apparatus, the laying out the wire, when on a field, may be done either by the carriage moving away from a spot where one of the telegraphic instruments is to be situated, paying out the wire as the carriage is drawn away, or the carriage having been brought to its position, the insulated wire may be run out and carried by the hand. By this arrangement, not only is the whole apparatus necessary to construct an electric telegraph in any locality compactly arranged, but, by reason of the insulated wire being wound on an axis, with suitable gearing to wind and unwind the same, and the whole apparatus being in a carriage on wheels, the same may be transported, from place to place, with great facility. And, although I prefer that the carriage should be such as to be drawn by horses, I do not confine myself thereto, for if the requisite insulated wire is wound on a roller, or rollers, on axes, with suitable gearing to wind and unwind the insulated wire, and the same are combined with and carried by a suitable carriage, on wheels, whether arranged to be moved on the field by beasts or by hand, the same will be according to my invention.—In witness, &c.

FREDERICK WILLIAM CADOGAN.

Specification of the Patent granted to CHARLES BRI
of Dunmow, in the County of Essex, for Impro
in Printing Machinery.—Dated October 24, 1
(Communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c.,
Heretofore in cylinder-printing machines where th
of type is horizontal it has been usual to cause the
type to move to and fro under the printing cylinder,
simply rotates on its axis, the form of type becomin
by passing under stationary inking-rollers. Now,
vention consists of fixing the form of type and of
to the printing cylinder a to-and-fro and also a
motion over the form of type. The type is inked by
of the inking apparatus being caused to move to
over the type.

Having thus stated the nature of the said inve
will proceed to describe the manner of perform
same.

Description of the Drawings.

Fig. 1, shows a side view of so much of a
arranged or combined, according to the improvem
will enable me, aided by the other views shown
drawings, to describe the invention.

Fig. 2, is an end view. The other figures show
drawings are details, which are marked with th
letters of reference as those on figs. 1 and 2. *a*,
main or driving axis put into motion by a handl
the fly-wheel, *c*, or otherwise, as is well understood;
axis, *a*, is a cog-wheel, *d*, which takes into and dr
cog-wheel, *e*, which by a connecting-rod, *f*, gives
to the rack, *g*, which rocks on the axis, g^1, belo
rocking motion thus communicated to the rack, *g*
it by means of the cog-wheel, h^1, to move the
first in one direction and then in the other. On
h, are two cog-wheels, *i*, *i*, which gear into the ra
of the carriage, *k*, of the printing-roller, *l*, and
means the printing-roller, *l*, is caused to move to
over the form of type, *m*, fixed to the bed of the
n, *n*, are inking-rollers carried by the carriage, *k*,

these inking-rollers pass over and act in contact with a roller, o, which receives ink from the inking-roller in the trough, o^1, which is brought up against the roller, o, by the roller, o^2, moved by the weighted lever each time the carriage, k, runs out, as is shown by the drawing, and motion is communicated to the roller, o, by the shaft, o^3, driven by a bevelled-toothed wheel on the main shaft or axis, a, taking into a similar wheel on the shaft, o^3, and motion is communicated to the roller, o, from the shaft, o^3, by bevelled-toothed wheels, as is shown; p, is the table on which the paper to be printed is placed, and the edge of a sheet is pushed up so as to be taken by the fingers, q, on the axis, q^1; these fingers have at all times a tendency to press on to the surface of the printing cylinder, l, and they are only moved therefrom in order that they may at the proper intervals take hold of and let go the paper, which is performed in the following manner: when the cylinder comes back to the feeding-table, p, a projecting-arm, q^3, on the axis, q^1, of the fingers, q, comes against fixed inclined springs, q^4, on the feeding-table, and by such means the axis, q^1, is moved partly round, which causes the points of the fingers, q, to separate from the surface of the printing cylinder, l, so that the edge of the next sheet of paper may come under the fingers and against the printing cylinder, so that when the movement outward of the printing cylinder takes place and the fingers are released, they will close on the paper and hold it to the cylinder. The cylinder in its movement will cause the paper to be brought in contact with the type, but when it has arrived at the position shown by the red lines in fig. 1, the paper will be released by means of the crank or projection, q^2, on the axis, q^1, coming against the crank-projection, q^6, which is fixed to the carriage, k. That end of the paper then being let go drops on to the creeping-tapes, s, carried by the rollers, s^1. These rollers, s^1, are carried by a suitable frame and are attached to the carriage, k, in such manner as to be moved to and fro with it, and motion is to be given to one of these rollers, s^1, so that the upper surface of the tapes, s, will move in a direction away from the printing cylinder; hence the tapes will progressively lift the paper off the type as the printing cylinder proceeds outwards, and from these tapes the printed paper may be taken, as soon as the whole has been brought on to the tapes, s; motion may be given to one of the rollers, s^1, from the axis of the

printing-roller or otherwise, or the paper when p
may be taken off the type by other means; *t*, *t*, a
bars which slide on the upper part of the machin
are at each side thereof, and on these bars are form
clines, t^1, and on the upper bed or surface of the ma
there are formed similar inclines; hence when the ba
moved by the carriage, *k*, coming against the projecti
on the bars, and thereby moving or sliding those bars,
bars will rise and come in contact with the ends
printing cylinder, and lift it up in its bearings a sho
tance, so that in going back it will be away from the s
of the type, and the axis of the printing cylinder i
mitted to rise in its bearings in the following manne
v, are levers which are retained down on the axis
printing cylinder by the catches, v^1, v^1, when the p
cylinder is running out, but when the cylinder co
the end of its run, the catches, v^1, are allowed to
back, which they are caused to do by springs or oth
and they are enabled to go back by reason of the r
switch-formed apparatus applied to the cog-wheel,
the ends of the axis of the printing cylinder. The
rail or guide, *u*, at each end of the cylinder causes t
or projection, v^2, on the catch, v^1, when on the inte
press the catch, v^1, and thus to hold down its lev
when the pin comes to the end of the rail it admits
catch moving away from its lever, and in that cond
remains till the switch point, u^1, comes outside of t
and presses it inwards, when the catch will be again
to hold its lever, and this will take place when the
ing cylinder is about to move out. Hence it will b
that as the printing cylinder moves out it will be bel
in its carriage, *k*, and will press on the type, and
carriage, *k*, coming against the ends of the sliding-
will cause the printing cylinder to be lifted and to
lifted till it gets back, and the carriage, *k*, comes
the projections on the other ends of the sliding-ba
moves them back in to the position shown in fig. 1.

Having thus described the nature of the said in
and the manner of performing the same, I would
understood that I make no claim to any of the par
rately, nor do I confine myself to the precise details
But what I claim is the combination of parts her
scribed.—In witness, &c.

CHARLES BREW

Specification of the Patent granted to CHARLES LUDOVIC AUGUSTUS MEINIG, *of* 103, *Leadenhall-street, in the City of London, for Improvements in Galvanic Batteries.*—Dated October 13, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The object of my invention is to produce an easily portable and manageable battery, which may be carried in the pocket, or otherwise appended to the body, while in action.

Fig. 1, represents such a battery. A, B, C, D, is a slab of gutta-percha, or other suitable non-conducting and non-absorbent material, having an elevated rib or edge, A, C, and B, D, on two of the edges, their height being from one-fourth to one thirty-second the width of the slab; *i*, *i*, *i*, *i*, are pairs of strips of copper and zinc, or other dissimilar metals, soldered together in their whole length, and pressed, in a heated state, down into the slab, so that the ends of the pairs are fixed in the elevated ribs on the sides, and the inferior edge of the pairs into the bottom of the slab, and with space between each pair, to form the cells of the battery, the zinc of one pair standing opposite the copper of the next pair, and the poles being at *x* and *y*. For taking up the fluids of this battery, so as to allow of its being placed in all positions without letting out the fluid, or disturbing its action, I can either fill the cells with cotton thread, or braid, or sponge, or other fibrous non-conducting and absorbing material; or I can fill the cells with the metallic powder or paste, mentioned below; or I can make use of a second slab of gutta-percha, or other suitable non-conducting material, on which strips of fibrous non-conducting and absorbent materials are fixed in such a manner, as to go into and fit in each of the cells, when this slab is applied on the top of the battery, so that when these strips of fibrous material have been previously moistened, they supply the fluid to the battery when inserted in the cells.

Fig. 2, shows such a slab, E, F, G, H, with strips of cotton braid, *o*, *o*, *o*, *o*, which project so much from the slab as the depth of the cells of the battery to which they are to be applied, and are fixed and kept in their place by means of upright points of gutta-percha, fixed on and projecting from the slab, designated in the drawing by the black points, . . . , to

which the braid is cemented by means of gutta-perch
tion. The strips of cotton braid are of such a thi
that when they are moistened with fluid and insert
the cells of the battery they fill up the width of the ce
consequently, are in contact with both metals of ea
Instead of thin cotton braid thin slices of sponge, or
wood, or other suitable fibrous substance, may be us

Fig. 3, shows the same construction of battery,
different arrangement, the pairs being fixed in a
slab, so that the slab contains combinations of batte
this principle, viz., battery No. 1, the poles at A
battery No. 2, poles at B and C; battery No. 3, pol
and D; battery No. 4, poles at D and E; battery
poles at E and F; battery No. 6, poles at F and G.
is a metallic connexion between the metallic strips
connecting one battery with the next, at *a*, *b*, *c*, *d*,
whereas there is no metallic connexion at *i*, betwe
batteries Nos. 1 and 6. The object of this arrangen
that I can, at option and with facility, use a sma
greater intensity; for if one conducting wire is con
with A, and I connect the other conducting wire wi
have the intensity of five cells; but if, instead of con
the other wire with B, I connect it with C (the fir
remaining in connexion with A), I have the intensity
cells; if I connect it with D, I have fifteen cells;
twenty cells; with F, twenty-five cells; and with G,
cells included in the circuit.

In order to produce a greater intensity (number of
with only trifling addition to the bulk, I can constr
batteries, as above described, on both sides of one a
same slab of gutta-percha, and connect the battery,
teries, on one side, with the battery, or batteries,
other side.

For the purpose of applying currents of electric
means of these small portable batteries, during some
of time, to various parts of the human and animal
they are inclosed in envelopes, their poles connec
insulated conducting wires, or braids, to metallic
which I construct with a loop at the back. This
passed through a hole in the middle of a piece of st
plaster, larger than the disc, the gummed side
plaster being turned towards the back of the disc, an
the hook terminating the insulated conducting w
braid, is inserted into the loop of the disc. The disc

fixed and retained conveniently by the projecting part of the plaster on any place of the body to which it is applied, and this simple arrangement does away with the great inconvenience of fixing bands, hitherto employed.

Instead of filling the cells of these batteries with fibrous and merely absorbing substances for taking up a suitable exciting liquid, I can make use of a metallic powder or paste, which I excite by water, or a suitable acid; for which powder I use an oxide, or salt of such metals, which are more negative than the positive metal of the battery for which it is intended; or I may take dry metallic acid, such as antimonic-phosphoric or arsenic acid, in a dry and powdered state; and with such salt, oxide, or acid, I mix up an equal or unequal quantity of powdered starch, or suitable substance containing starch, such as flour; and as the starch, or substance containing starch, contributes to retard the decomposition of the oxide, or salt, when fluid is applied, and make the action less violent but more constant, the relative quantities of the two ingredients named, which I use in the powder, depend upon the nature of the effect which I wish to produce. If I find it convenient to make the powder or paste still more porous, I add to the above compound of oxide, salt, or acid, with starch, some suitable non-conducting granular matter, such as pulverized silica, or glass.

When such powder or paste, as above described, is filled into the cells in a dry state, little or no action takes place; but when water, or diluted acid, or a weak solution of the salt of a metal more negative than the positive metal of the battery, is communicated to and absorbed by the paste, the battery acts more powerfully and constantly than with the same fluid alone.

I do not limit my claim to the exact shape or manner of application specified above, but what I claim as my invention is,

First, The construction of portable galvanic or voltaic batteries, which can be placed in any position, without letting out the fluid, by fixing on a slab of gutta-percha, or other suitable non-conducting and non-absorbent material, pairs, consisting of two dissimilar metals, in metallic connexion, in such a manner that cells are formed between the pairs, adapted to take up a porous non-conducting substance, which will absorb and retain the fluid; the pairs being placed opposite each other, so that the positive metal of one

pair stands opposite the negative metal of the next
the same cell, but without contact, and that the fluid
cell does not communicate with the fluid in the othe
all as above described.

Second, The arrangement by which the fibrous no
ducting and absorbent material intended to serve
receptacle of the fluid in batteries is fixed on a se
non-conducting substance, so as to be inserted, remove
cleansed with facility, as above described.

Third, The arrangements of the discs and their fixi
means of sticking-plaster, to the body, as above desc

Fourth, The use of a powder or paste, consisting
salt, the oxide, or the dry acid of a metal more negativ
the positive metal of the battery, mixed up with sta
suitable substance containing starch, and with or w
granular non-conducting matter, as such powdered
silica, &c. This paste to serve in the cells of batteri
receptacle for the fluid and a generator of electrici
fully described above.—In witness, &c.

CHARLES LUDOVIC AUGUSTUS MEI

Specification of the Patent granted to ELLEN JON
Palace-street, Pimlico, in the County of Mid
Widow, for Improvements in Steam-Engine Govern
Dated October 17, 1853.—(Communication from h
husband.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c.,
This invention consists of applying springs acting
piston in a cylinder to prevent the prejudicial eff
any sudden action of a governor. The springs recei
first effort of any sudden action and tend to neutraliz

Having thus stated the nature of the said inve
I will proceed to describe the manner of performin
same.

The invention consists of employing springs, and b
ference in such manner that one acts by compressio
the other by extension, and the action of the gover
regulated by these springs, through the lever, by whi
connexion is usually made between the governor
throttle-valve. The form of the springs may be v

but I believe helical or spiral springs to be the best for the purpose, and it is preferred that they should be arranged as is shown in the drawing.

Fig. 1, is an external elevation; and

Fig. 2, an elevation in section. *a*, is the spring for acting by extension, fastened to the bottom of a small cylinder, F, which in use is bolted to the floor or other convenient place; *b*, is the spring to resist compression placed in the same cylinder, but pressing against the cover; *c*, *c*, is the rod connecting the governor-gear with the springs, this rod is made fast at its lowest end to the upper end of the lower spring, and the other end of the lower spring is made fast to the lower end of the cylinder. On the lower end of the rod, *c*, is formed an enlargement or piston, c^1, which slides freely in the cylinder, F. The upper spring is placed on the rod, *c*, above the piston or enlargement, c^1, the upper end of the spring coming against the under side of the cover of the cylinder; hence any effort to raise the rod, *c*, causes the upper spring to be compressed and the under spring to be extended. The governor-lever is connected to *c* by a socket, *d*. It should be remarked, that, although it is preferred to have the two springs in each apparatus acting as above described, it is not essential that such should be the case, as one only may be used.

Having thus described the nature of the invention, and the manner of performing the same, I would have it understood that I make no claim to the parts separately;

But what I claim is, the combination of parts herein described.—In witness, &c.

ELLEN JONES.

Specification of the Patent granted to HENRY CLAYTON, ***of the Atlas Works, Upper Park-place, Dorset-square, in the County of Middlesex, Machinist, for Improvements in the Manufacture of Bricks and Tiles.***—Dated October 8, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Heretofore in the manufacture of bricks and tiles by forcing brick-earth in the plastic state through moulding orifices, it

has been usual to have all the sides of a moulding orifice fixed.

Now my invention consists of constructing each moulding orifice with two moving surfaces and two fixed surfaces; the two moving surfaces consisting of rollers, which are put in motion by the passage of the plastic earth between them, the interior of the moulding orifice where the rollers come being arranged to direct the plastic matter between the rollers.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

Fig. 1, is a plan of the combination of mechanical parts which, according to my invention, constitutes the die or moulding orifice of a pug-mill or other machine suitable for making bricks or tiles by expressing brick-earth, clay, or suitable plastic material through moulding orifices. The drawing shows the moulding die or orifice for making bricks of the ordinary size, but the dimensions will be varied, as will readily be understood in making like moulding dies or orifices for other sizes or forms of bricks, and for making tiles.

Fig. 2, is a front view.

Fig. 3, is a transverse section; and

Fig. 4, is an end view. The arrangement shown is suitable for fixing at the lower part of the cylinder of a pug-mill; and if like apparatus is to be applied and fixed to other forms of expressing machinery, the part by which the apparatus is to be fixed will be varied accordingly, and as will be readily understood by an engineer. In place of forming the die or moulding orifice, as heretofore, with four fixed sides, the one shown in the drawing is composed of two fixed and two moving or rotating sides. *a*, is the upper fixed side, and *b* is the lower fixed side of the moulding orifice or die; the outer edges of these are not straight, but somewhat convex, so that the clay when first pressed is concave on its upper and under surfaces. *c*, *c*, are the two moving ends or sides of the moulding orifice or die, and they consist of two rollers, which are somewhat conical, as shown, and they are covered with cotton-velvet or other suitable fabric. And in order that the surfaces of these rollers may be kept somewhat moist, they are made with a groove, *d*, at each of their upper ends to receive water,

which, descending down the woven fabric which surrounds the rollers, filters through the fabric and moistens the surfaces. *e*, *e*, are two plates which form the ends of the moulding orifice or die; the front edges of these plates come parallel with the axes of the rollers. It will be seen that the moulding orifice or die is, so far as these ends, *e*, *e*, and the interior form of the upper and lower parts, *a*, *b*, are concerned, very similar to an ordinary moulding orifice or die. The clay or brick-earth, as it is expressed by a pug-mill or other suitable expressing machine, is gradually compressed into form as it approaches the outer parts of the moulding orifice or die; but it will be seen that the parts, *a*, *b*, come more forward or extend further than the end or side plates, *e*, *e*, do; consequently, so soon as the clay or plastic material which is being expressed gets beyond the front edges of the plates, *e*, *e*, it will come in contact with the two rollers, and by its pressure thereon will put such rollers in motion; the upper and under surfaces of the clay will, however, still be subject to the fixed upper and under surfaces, *a* and *b*, which, as before stated, are not straight lines or parallel to each other at their outer edges, but convex; hence the clay or brick-earth on the top and bottom surfaces is, as it issues from the moulding orifice or die, somewhat concave; the upper surface of the clay is also somewhat wider than the under surface thereof, but the clay or brick-earth quickly assumes a rectangular form or nearly so after it gets away from the die or moulding orifice. *h*, *h*, are scrapers to remove any clay or brick-earth which may adhere to and pass round with the rollers; ordinarily I have found that the two rollers may move separately and independently of each other; but as some clays may not drive the rollers equally I have provided pulleys, *f*, *f*, on the axes of the rollers, in order that they may be connected by a cross-band, by which any tendency in the machine to force the clay faster against one roller than the other is compensated for, and the one roller is prevented moving faster than the other: and there is another advantage in coupling the rollers together, for it sometimes happens that they are found to stick, in which cases, by the aid of a key, *g*, the workmen, by turning one roller a short distance, will cause both to move forwards, and thus he will overcome any temporary impediment. If bricks with mouldings are to be made, then the fixed part or parts, *a* or *b*, or the roller or rollers, are to be made to vary in form accordingly.

I would state that, although I prefer in general that the rollers should be used at the two ends, and that the fixed parts, *a*, *b*, of a moulding orifice or die should be used at top and bottom, this state of things may be reversed.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I am aware that clay or brick-earth has, in cases where no expressing machinery has been employed, been shaped by the rotation of four rollers, so arranged as to form an opening or passage between them of the size of the intended brick, so that, when driven by suitable power, they have rolled the clay into a suitable form to be cut into bricks. I do not therefore claim the same, nor do I claim any of the parts above shown and explained separately.

But what I claim is, the forming of a die or moulding orifice to an expressing machine by the combination of parts therein described.—In witness, &c.

HENRY CLAYTON.

Specification of the Patent granted to RICHARD ARCHIBALD BROOMAN, *of Fleet-street, in the City of London, for Certain Improvements in the Machinery for Converting Caoutchouc into Circular Blocks or Cylinders, and for Manufacturing the same into Sheets.*—Dated July 2, 1853. —(Communication.)

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The object of the first part of the invention is to produce a compact cylinder or roller, free from air bubbles. The caoutchouc is first freed from impurities and foreign matters by any process now adopted for such purpose, and is then fed in between two iron cylinders or rollers, heated by currents of steam, hot water, or other heating medium. The rollers are caused to revolve and give out, on the opposite side, a thick sheet of caoutchouc, which is led on to a small roller, termed the gathering roller, the axis of which is free to rise in a slot in the frame of the apparatus, while it is prevented rising too rapidly by means of a weighted lever pressing on the upper surface thereof. Immediately under the gathering roller is a hollow fixed roller, heated in the inside. Both the gathering roller and

fixed roller are caused to revolve, and the caoutchouc winds itself round the upper gathering roller in the form of a solid mass or cylinder; the pressure exerted on the gathering roller, together with the heat from the fixed heated roller, causing adhesion between the several thicknesses, at the same time the pressure forces or squeezes out any globules of air that may exist in the caoutchouc. When a cylinder of a sufficient size has been thus obtained it is transferred to another machine together with the gathering roller; or it may be mounted upon a separate axis. It is then caused to revolve in front of a fixed knife or blade, which slices or cuts off a continuous length of the caoutchouc in sheets, varying in thickness with the setting of the knife, which slides in a bed, and can be regulated as required.

Fig. 1, is a vertical section of the machine for forming the caoutchouc into a compact cylinder or roller. *a*, *b*, are two hollow cylinders, having their bearings in the side frames, *c*, *c*. They may be heated by steam or hot water, iron, or other substance previously heated and introduced into the centre of the cylinders. The bearings of the cylinders, *b*, *d*, revolve always at a fixed height; those of the cylinder, *a*, are held down by the pressure screws, *e*, which work through nuts in the top of the frame. The screws, *e*, each terminate at top in a pinion, *f*, the teeth of which gear into two endless screws mounted on the shaft, *g*. The distance between the two cylinders, *a* and *b*, can be regulated by means of a crank handle fitted to the shaft, *g*. The cylinder, *d*, is supported in bearings in the inside frames, *h*, *h*. The axis of the cylinder, *i*, revolves in slots in the side frames, *h*, *h*, which allow it to rise and fall, and also to revolve when set in motion by the rotation of the cylinder, *d*. In order to ensure the two cylinders, *a* and *b*, always revolving at a constantly uniform rate whatever may be the distance between them, I provide four wheels, *k*, *k*, k^1, k^2, which gear into each other, and are mounted in bearings, *l*. This wheel-gearing is clearly seen in the side elevation, fig. 2. The two wheels, *k*, *k*, are mounted upon the axes of the cylinders, *a* and *b*, and do not gear directly into each other, but do so through the wheels k^1, k^2. Thus neither of the cylinders, *a* and *b*, can revolve without the other revolving at the same speed. Motion is communicated from any prime mover to the cylinders, *b*, *d*, through the coupled shafts, *m*, *n*, which are provided with toothed wheels, which gear into other toothed wheels on the axes of

the cylinders, *b*, *d*. The manner of working the machinery so as to form a cylindrical piece of caoutchouc is as follows:—When the substance to be treated has been well cleansed it is placed on a feeding table, a^1, and fed into and between the two heated cylinders, *a* and *b*; the caoutchouc is thus formed into a sheet which, on being led between the cylinders, *d* and *i*, (which may be also heated if desired,) is rolled or wrapped round the cylinder, *i*. Each sheet of caoutchouc adheres to the preceding, partly by the effect of heat, and partly by pressure exerted upon cylinder, *i*, by means of the weighted lever, *y*. When the cylindrical mass of caoutchouc, *o*, attains the desired size, it is removed from the machinery with its gathering roller, and transferred to that next to be described.

Fig. 3, is a side elevation, and

Fig. 4, a plan, of a machine for slicing or cutting up blocks of india-rubber into continuous sheets.

Fig. 5, is a detached view, on an enlarged scale, of part of fig. 3. The cylindrical block of caoutchouc, *o*, on the gathering shaft is placed in a carriage or frame in the machine, which is mounted between bearings so as to allow the shaft to receive a rotary movement; the shaft is provided with a wheel, *p*, which gears into a pinion driven by a wheel, which at the same time communicates motion to a screw, which propels the carriage or frame carrying the caoutchouc, *o*, towards the cutter, *q*. This cutter is mounted in a bearing, *r*, which receives an alternating to-and-fro movement by means of the crank, *s*. The end of the blade carrier, *r*, shown detached in fig. 5, is connected to a bell crank lever, *t*, centered in a support, *u*, which terminates in an opening through which the bar, *v*, fig. 2, passes. This bar is fixed to the circular plate or disc, *w*, supported on a shaft on which is mounted a ratchet wheel. The disc, *w*, is furnished with a certain number of clicks, which enter between the teeth of the ratchet wheel, but are so spaced as to divide the length of a tooth, so that at every movement the plate receives it only transmits to the wheel the length of a tooth divided by the number of clicks; for example, if there should be ten at each movement of the plate, this wheel will only move forward a tenth of the tooth, and this movement will be communicated to the screw of the frame or carriage by the gearing represented in the drawing. The relation of speed between the ratchet-wheel and the frame which carries the block of caoutchouc may further be

varied by changing a portion of the gearing which serves to transmit the motion. Thus it may be shown, by placing a cylindrical block of caoutchouc on the carriage of the machine, it may be transformed into a sheet of great length, and may be cut of any desired thickness, and with a perfectly smooth surface.

And having now described the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim as the said invention is, the forming of caoutchouc into solid blocks or cylinders, and the subsequent formation thereof into sheets, in the manner hereinbefore described, and represented in the drawings hereunto annexed.—In witness, &c.

RICHARD ARCHIBALD BROOMAN.

Specification of the Patent granted to JAMES WEBSTER, *of Leicester, for Improvements in Pressure Gauges.*—Dated August 23, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of a combination of apparatus for indicating the pressure of steam and other fluids by a column of mercury. For this purpose a glass tube and graduated dial are employed, similar to those heretofore used in pressure gauges, whether they be employed for indicating the pressure of steam or other fluid, in a boiler or other vessel, or for indicating a vacuum when pressed on by air. The glass tube is fixed in a globular or other suitably formed vessel, which has a thin metal (by preference steel) partition across it. Mercury is on one side, and water, or it might be other fluid, is placed on the other side of the partition. The globular-formed vessel is fixed on a cylinder, which is closed at bottom, but has a pipe rising up through the closed end, over which pipe is fixed an inverted vessel or tube. In use the steam or other fluid presses on the water, and by its pressure against the partition the mercury is caused to rise up the glass tube and to indicate the pressure.

Having thus stated the nature of my said invention,

I will proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, shows a vertical section, and

Fig. 2, a front elevation, of a steam-pressure gauge, constructed according to my invention.

Fig. 3, shows a vertical section, and

Fig. 4, a front elevation, of an air-pressure gauge, the only difference being that in the one case (figs. 1 and 2) the pressure of steam acts on the under side of a flexible partition and raises a column of mercury into the glass tube of the gauge, by which the pressure will be indicated by the graduated scale, and in the other case (figs. 3 and 4) the atmosphere presses on the mercury in the glass tube of the gauge and causes it to descend into the vessel. And the respective scales are graduated accordingly, the zero point of one instrument being at the lower part of the scale, the zero point of the other being at the upper part of the scale. *a*, is the vessel to which the glass tube, *b*, is fitted; this vessel is in two parts, and is divided by a partition, *c*, which I prefer to be of thin sheet steel, having on either side a piece of waterproof fabric; *b*, is the glass tube, which is open to the atmosphere at top; *e*, is the graduated scale; *f*, is a tube, which in figs. 1 and 2, I fill up to the bend (and also the lower compartment of the vessel, *a*,) with water, so that the steam is kept from contact with the partition in the vessel, *a*. The tube, *f*, in figs. 3 and 4, is to be connected with the cylinder or vessel, which is vacuous, and the extent of vacuum will be indicated by the extent to which the column of mercury falls.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I make no claim to the parts separately;

But what I claim is, the combination of the parts shown and described.—In witness, &c.

JAMES WEBSTER.

Specification of the Patent granted to HENRY JOHN BETJEMANN, *of New Oxford-street, in the County of Middlesex, for Improvements in Apparatus for Fixing Capsules on the Necks of Bottles and other Vessels.*—Dated October 5, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of a method of combining apparatus for pressing capsules on to the necks of bottles and other vessels. For this purpose several cords or bands are used, each independent of the other; one end of each is made fast to the upper part of the apparatus, and is at its other end connected with a spring, or other means of admitting a separate elastic action or motion, and each cord or band is at the same time capable of being pulled on by a treadle or otherwise. There are two sets of such bands or cords, and the cords in each set are bent in opposite directions; the bends of the neighbouring bands or cords of one set are caused to work between the spaces of the neighbouring cords or bands of the other set, by which means a tubular eye or opening is formed, into which the neck of a bottle or other vessel having a capsule on it is passed, when by pulling on the several bands or cords they close on the capsule and cause it to assume the figure of the neck, and by reason of the neighbouring cords or bands being capable of independent action, they can be caused to embrace a smaller or larger part of the neck. In order that the bent part of each cord or band may expand to release the neck, elasticity is given to or caused to act on such bent part.

Having thus briefly described my invention, and the manner in which the same is to be performed, I will now proceed to give a detailed account thereof, and describe the accompanying drawings.

Description of the Drawings.

Fig. 1, is a front view.
Fig. 2, a side view.
Fig. 3, a section; and
Fig. 4, a plan of apparatus constructed according to my invention. *a*, *a*, is the framing; *b*, is a treadle, similar to that of a lathe; *c*, *c*, are connecting rods attached to the levers

or arms, *d*, *d*, which are fixed to the squared ends of the parts, *e*, *e*, which are mounted in bearings at a^1, a^1, affixed to the framing, *a*, *a*. To the parts, *e*, *e*, are attached several springs, *f*, *f*, to which are affixed the one end of each of the bands or cords, *g*, *g*, their other ends being fastened to the framing, *a*, *a*, by screws or otherwise, as shown; *h*, *h*, are pulleys or guides, to guide and keep the cords or bands, *g*, *g*, in their proper positions; *i*, is a filling piece, on which they rest when out of action; *j*, *j*, are levers or jaws covered with vulcanized india-rubber, so as to offer a soft substance to the neck of the bottle, or vessel, and capsule, which also serve to prevent the cords or bands from escaping forwards (hereinafter more fully described); *k*, is the holder for the bottles or other vessels to be capsuled, which I prefer should have strips of vulcanized india-rubber within it, in order to offer additional contact to insure the revolving of the bottle or vessel. The holder, *k*, is mounted on the frame, k^1, k^1, which frame is capable of a to-and-fro action between the friction-rollers, a^2, a^2, mounted on the frames, a^3, a^3, attached to the framing, *a*, *a*; *l*, is a handle, by which the holder, *k*, and bottle or other vessel contained are caused to revolve; *m*, *m*, are weights; and *n*, *n*, cords, having at all times a tendency to draw the holder, *k*, forwards to the opening formed by the bands or cords, *g*, *g*; the cords, *n*, *n*, pass over pulleys, *o*, *o*, mounted and attached to the framing, *a*, *a*, as shown; the other ends of the cords, *n*, *n*, being attached to the frame, k^1, k^1. To capsule a bottle or other vessel the capsule is first placed on the neck by hand, as usual, and the bottle or vessel placed in the holder, *k*, which will be drawn forward by the weights, *m*, *m*, into the opening, *p*, (see fig. 1,) formed by the cords or bands, *g*, *g*, until the capsule end of the vessel arrives at the back-plate, a^4, (see fig. 2,) which is clothed with vulcanized india-rubber, and thus forms a cushion for it to revolve in.

The treadle, *b*, is then to be pressed down, by which the connecting rods, *c*, *c*, will cause the levers, *d*, *d*, to be also drawn down, as shown by the dotted lines in fig. 1, consequently the parts, *e*, *e*, will turn in their bearings, a^1, a^1, and carry with them the springs, *f*, *f*, and the ends of the bands or cords, *g*, *g*, attached thereto, in such manner as to cause them to embrace tightly the capsule to the neck of the bottle or other vessel, the cords, *g*, *g*, being attached to the springs, *f*, *f*, and the springs, *f*, *f*, being capable of

independent action; allowance is made for any form or contour of vessel to be capsuled, the action on the springs, *f*, being according to the various diameters of the neck of the vessel. The downward action of the treadle, *b*, also allows of the rod, *q*, being pressed downwards by the action of the spring, *r*, by which the links, *s*, *s*, attached to the rod, *q*, and levers or jaws, *j*, *j*, will also be caused to descend and thereby reduce such opening during the pressure of the cords or bands, *g*, *g*, on the capsule; the handle, *l*, is turned round while the pressure of the cords is on the capsule and neck of the bottle, and the capsuling will be complete; then by removing the pressure from the treadle, *b*, the treadle will be again borne upwards by the weight, *t*, and carry with it the rod, *q*, thereby overcoming and compressing the spring, *r*, between the part, a^4, of the framing and the stop, q^1, of the rod, *q*, and thus acting upon the links, *s*, *s*, and jaws, *j*, *j*, in such manner as to open them out; and as the cords or bands, *g*, *g*, are stiffened by having within them tempered steel wire, they also open out by the rising of the treadle, *b*, and parts connected therewith; and by drawing back the frame, k^1, k^1, and holder, *k*, the neck of the vessel may readily be removed and another bottle or vessel capsuled in like manner, and so on continuously.

Having thus described the nature of my invention and the manner of performing the same, I would have it understood that I make no claim to any of the parts separately, nor do I confine myself to the details shown and described.

But what I claim is, the combination of the parts, *f*, *f*, *g*, *g*, and parts connected and acting therewith, as herein explained.—In witness, &c.

HENRY JOHN BETJEMANN.

Specification of the Patent granted to MARY ANN RYLANDS, ***of the Borough of Kingston-upon-Hull, Widow, for Improvements in Yards and Spars of Ships and other Vessels.***—**Dated July 22, 1853.—(Communication from her late husband.)**

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object improvements in building up pieces into a yard or spar, and consists of dividing a stick of timber (which is shorter than the desired yard or

spar) longitudinally, and causing the two thick ends to be overlapped and dowelled and hooped together, the two outer ends being made up by scarfing pieces, by dowels and hoops. By this mode of construction yards and spars will be of more uniform strength, and be made from less costly timber than heretofore.

Having thus stated the nature of the said invention, I will proceed to describe the manner of performing the same.

Heretofore in the manufacture of yards it has been most generally the practice to employ a piece of timber of a length equal to the intended yard, and a yard has been formed by cutting the piece of timber tapering from the centre to the outer ends, and a similar practice has been pursued in making spars, the piece of timber for each yard or spar being of a length equal to the length of the yard or spar, the shaping of the yard or spar being by cutting away of the wood at the different parts to produce the desired form, by which means a yard or spar is unequal in its strength on either side of the thickest part, by reason of one end of a yard or spar being made from the lower end of a tree, and the other end of a yard or spar being made of the wood of the upper part of the tree. It should, however, be stated that built yards and spars have before been made, but by reason of the manner of forming and putting the parts together they have not been approved of or found to be useful. The object of this invention is to employ pieces of timber of a less length than the intended yard or spar, and so to cut them into parts and to combine the parts that the proper length for a yard or spar may be obtained, and at the same time the strength on one side of the thicker parts should correspond with the strength of the other side, by reason of like parts of the wood coming to the outward parts of a yard or spar, and it is preferred that the wood of the root end of the tree should come to the centre, and that the upper end of the tree should come outwards or towards the end of the spar, as will readily be understood by reference to the figures of drawing hereunto annexed.

Fig. 1, shows a piece of timber suitable for being made into the two principal parts of a yard, such as is shown at figs. 3, 4, and 5.

Fig. 2, is another piece of timber for making the two end filling pieces. The pieces of timber used it is preferred should not be squared, but be employed of the natural

taper, but whether squared or not it is preferred that the root end of the tree should come towards the middle of the length, and that the longitudinal join should be vertical, but these may be varied. The piece of timber, fig. 1, is cut into the two parts, *a*, *a*, as indicated by the drawing, and they come together as shown at figs. 3, 4, and 5, and the yard is completed by the said pieces, *b*, *b*, cut from the piece of timber, fig. 2. The parts of the yard are fastened together by hoops, *c*, *c*, and pins or dowels, *d*, *d*, as shown, and in a similar manner are other forms of spars made.

Having thus described the nature of the invention and the manner of performing the same, I would have it understood that I do not confine myself to the precise details, as the same may be varied without departing from the invention.

But what I claim is, the mode herein described of manufacturing yards and spars for ships and vessels.—In witness, &c.

MARY ANN RYLANDS.

Specification of the Patent granted to THOMAS WILLIAM GILBERT, *of Limehouse, Sailmaker, for Improvements in Sewing Sails and other Articles.*—Dated September 10, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Heretofore sewing-machines have been fixtures in regard to the fabrics sewed thereby, the fabrics being moved through the machine. Now my invention consists of making sewing-machines, to move step by step, according to the rapidity of the stitches, the fabrics being held stationary. For which purpose, the machine is supported on a frame of such dimensions as will allow of the extent of movement required, and the machine is made to slide or move in such frame by a ratchet, or other step-by-step movement, the machine making a stitch or stitches each time of moving. And in order to obtain increased facility for manufacturing sails and other articles where two or more rows of stitches are required, two or more sewing-machines are combined, and caused to move together. To flatten the stitches rollers are applied to the sewing-machine, and are caused to act on

and press the rows of stitches as the sewing-machine ma
its return movement.

Having thus stated the nature of my said invention, I
proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, is a side elevation; and

Fig. 2, a transverse section of so much of the appara
arranged according to my invention, as will enable m
describe the same. The arrangement shown is for worl
with machinery for making a single row of stitches,
if desired, the sewing parts of two machines may be
bined in one machine, so as simultaneously to produce
rows of stitches, the needles being at such a distance a
and in advance of one of the other, as to be able to
clear of each other, and capable of producing two par
rows of stitches. I would state, however, that I make no c
to the construction of sewing-machines, but use any suit
arrangements of sewing-machines, and I would state
according to my present experience, I prefer the Lanca
sewing-machines; and I would also state, that my impr
ments are not in sewing-machines themselves, but in thei
in combination with other apparatus, so arranged that the
ing-machine or machines employed may be caused to
step by step, or stitch by stitch, whilst the fabric rem
stationary, in place of the sewing-machines remai
stationary, as heretofore, and having the fabric move
them, which movement of the sewing-machines is
important where the fabrics to be sewed are heavy, suc
sail-cloth and others. In the drawing, only the framing
some of the moving parts of Lancashire sewing-mach
are shown, the other, or sewing parts thereof, being
known.

a, *a*, is the framing of the sewing-machines, which
flanched wheels, *b*, *b*, applied thereto, by means of which
sewing-machines are enabled to be moved along and be gu
by rails, *c*, *c*. The arrangement shown in the transverse
tion, fig. 2, is for two independent sewing-machines, w
may be used for working on different fabrics, or they ma
used, at the same time, in making the one sail. Moti
preferred to be given to the sewing-machines by hand,
workman may readily give motion to the machine by
handle, *d*, by one hand, and keep the fabrics, which a
be sewed together, adjusted to each other by the other h

By turning the handle, *d*, motion will be given to the axis, *e*, on which there are two cams, *f*, *g*, which actuate the sewing parts of the machine, as is well understood. The sewing-machines used may be moved by any suitable gearing or apparatus, suitably arranged for obtaining a progressive motion to the machine (equal to that necessary for the distance the stitches are apart, a convenient arrangement for this purpose being shown by the drawings), which, deriving motion from the axis, *e*, causes the wheels to progress a distance, step by step, corresponding with the successive stitches produced by the sewing-machine. On the axis, *e*, is a pinion, *h*, which takes into and gives motion to the cog-wheel, *i*, on the axis, *j*, on which is fixed a cone, *k*, which, by a strap, *l*, gives motion to the cone, *m*, on the axis, *n*. On the cone, *m*, is a pinion, *o*, which, when the machine is at work, is in gear with the cog-wheel, *p*, on the axes of two of the running wheels, but the pinion can be put out of gear by means of the lever, *q*, as shown. The position of the strap on the cones is adjusted by the forks, *r*, *s*, which can be fixed in any desired position on the bars, *t*; hence it will be evident that each step of movement made by the machine for each revolution of the axis, *e*, will depend on the length of stitch desired to be made, and this will be governed by the position of the driving-band or strap on the two cones, which, being once adjusted, the machine will move a step commensurate with the length of two stitches each revolution of the axis, the cams being arranged to make two stitches for each revolution of the axis, *e*. It will, however, be evident that, in place of the means shown and described, the machines, in place of being mounted on wheels, may be made to slide, and they may be moved step by step, or stitch by stitch, by ratchets, or otherwise, as is well understood. In the arrangement shown, there are two long tables or counters, *u*, *u*, with a space between them, at *v*, for the work of the two machines to fall to the floor, when the width and extent of the sails, or other articles, which are being made, require to do so, in order to be out of the way. The fabrics, which are to be sewed, are fastened to a bar, *w*, and the parts of the fabrics, which extend beyond the table, and under which the machine moves, are supported by projecting arms, w^1, hinged to the tables or counters, and which stand out at right angles to the sides of the tables, till the machines approach them, when they are in succession to be folded back against the side of the tables or counters, to admit of

the sewing-machines passing them, when they are ag
be moved out to support the fabrics, as the machin
caused to progress in the direction of the arrow sho
fig. 1 : the workman giving motion to a machine will
his other hand, adjust the fabrics, so as to come corre
the sewing-machine, which, it is to be understood,
as heretofore, in regard to the sewing, but it move
by step, or stitch by stitch, the bed of the machine
under the fabrics. *x*, *x*, are two pressing rollers, p
together by springs of vulcanized india-rubber.
rollers press the stitches, and work smooth as the ma
move.

Having thus described the nature of my said inv
and the manner of preparing the same, I would h
understood, that what I claim is, the arranging s
machines in combination with apparatus, in such n
as to admit of the sewing-machines being moved
stitches are progressively made whilst the fabric r
stationary.—In witness, &c.

THOMAS WILLIAM GILE

Specification of the Patent granted to WILLIAM GRE
*the Caledonian Mills, New Wharf-road, Caledonia
in the County of Middlesex, for Improvements in the
facture of Bricks.*—Dated October 6, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c.,
This invention consists of causing the clay after it ha
pugged alone to be again pugged with sawdust or oth
matter, which I prefer to have been first heated to dr
all moisture; and whilst in the heated state, these m
are introduced into the pug-mill with the clay and
therewith; and I prefer to make bricks with several
ations by having a fixed mould with a piston m
therein, through which a number of spikes or proj
work, so as to penetrate the bricks when in the moul
thus form perforations therein, the piston deliveri
brick from the mould. By these means the brick
more quickly dry, by reason of the sawdust or other
matters, and the drying will be facilitated by reason
perforations; the use of sawdust in bricks will also in

the processes of drying and burning bricks; and I find it important, when drying perforated bricks, to place them one on the other, on a perforated floor, so that the perforations may correspond, and then to cause air (heated or cold) to pass up through the floor and through the bricks thereon.

Having thus stated the nature of my invention, I will proceed to describe the manner of performing the same. In preparing clay or brick-earth for being moulded or formed into bricks, I combine with it a quantity of sawdust, or it may be of other dry matter, such as the husks of seed or others in a state of division, and I mix as much thereof with the clay or brick-earth (immediately before making the same up into bricks) as it will take, and yet retain such a state of plasticity as will admit of its being readily moulded, and I prefer to use such matters in as dry state as may be, and even heated, where that can be conveniently done, at moderate cost. I would remark, that it is important that the mixing of the dryers or absorbents of moisture with the clay should be in as little time before the moulding as may be. Having thus combined dry matters with the clay or brick-earth, I cause bricks to be moulded in the ordinary manner, either by hand or by machinery; but when the bricks are to be perforated, I prefer to use the machinery shown in the drawing. It should be stated that my object is not only to use absorbents of moisture to mix with the clay or brick-earth when about to mould the same, in order that the compound may quickly dry after moulding, but also, by using matters which will burn, to facilitate the burning of the bricks.

Fig. 1, shows a plan.

Fig. 2, a longitudinal section; and

Fig. 3, a transverse section of a machine for the making of perforated bricks, each having three or it may be more perforations through it. The drawing shows the parts arranged suitably for making bricks, with three perforations through each of them. *a*, *a*, is a fixed box or mould, in which the plastic materials are placed, having a piston, *b*, with perforations formed therein for the passage through of the spikes, *c*, *c*, *c*, by which the perforations are formed. The spikes, *c*, *c*, *c*, are connected to a cross-bar, *d*, having lugs, d^1, d^1, on its under side, by which the links, *e*, *e*, connect it with the lever handle, *f*. The piston, *b*, has lugs, b^1, b^1, on its underside, by which the links, *g*, *g*, are made to

connect it with the lever handle, *h*. The lever handles, and *h*, both work on the centre, *i*, as shown.

To form a brick, the mould is first filled with the plas material, the handle, *f*, is then raised, by which the spik *c*, *c*, will be caused to pass through the plastic materials the mould, *a*; the handle, *h*, is next to be raised, by whi the piston, *b*, will also be raised, and drive the brick th formed from the mould; the bricks are then to be remov by pallets to be dried.

Perforated bricks thus made, having sawdust or other d matter mixed up with the clay or brick-earth immediat before using the same, will require very little drying, and will be found convenient, where the clay has much moistu or where the sawdust or other matter has not been used a very dry state, to place such bricks on a floor one on t other, so as to bring the perforations through them correspond with one another, and with like perforations the floor, and by means of a fan or other blowing apparat to force air (whether hot or cold) below the floor and through the perforations in the bricks. When the bric are to be burnt in clamps, I use between each layer bricks a little ground breeze or coke, by the aid of whi and the sawdust in the bricks, I am able to burn the bric in clamps. When the sawdust or other matters used a very dry, and the clay or brick-earth is not largely charg with moisture, I have found that the bricks may be at on placed to burn, the heat, however, being allowed to ta place at first but slowly.

Having thus described the nature of my said inventi and the manner of performing the same, I would have understood that I am aware that bricks have before be moulded with perforations through them, but the arrang ment of the mould and parts working therewith were co structed differently to those herein described.

What I claim is, the manufacture of bricks by combini clay or brick-earth, immediately before moulding, with sa dust or other matters which act as dryers or absorbents moisture; and also the combination of apparatus here described for moulding perforated bricks.—In witness, &c

WILLIAM GEEVES.

Specification of a Patent granted to ABRAHAM POPE, *of* 81, *Edgware-road, in the County of Middlesex, Engineer, for Improvements in Furnaces.*—Dated October 13, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object the better combustion of coal or other carbonaceous matter, and preventing the forming and passing away of smoke, and consists of a peculiar combination of parts. Each furnace has two sets of fire-bars inclining towards the middle of the furnace, so that the fire is deepest in the middle. In front is a dead plate, on to which the fuel is fed, and from which it is pushed on to the fire-bars. At the back end of the fire-bars there is a space for the passage of air between the bridge and the ends of the fire-bars. The ash-pit is divided horizontally in such manner that the same is divided into two parts, each part of the ash-pit having its door or doors to regulate the passage of air, and to admit of the supply of air through the ash-pit to the two sets of bars to be different, the air passing into one part of the ash-pit not being allowed to get into the other part of the ash-pit.

Having thus stated the nature of the invention I will proceed to describe the manner of performing the same.

Description of the Drawings.

Fig. 1, shows a longitudinal section of a steam-boiler furnace, constructed according to my invention.

Fig. 2, shows a transverse section thereof.

Fig. 3, shows a front view; and

Fig. 4, a plan of the same. *a*, *b*, are the two sets of bars inclining to the middle of the furnace, so that the fire over the middle of the furnace is deepest. *c*, is the bridge, between which and the end of the furnace there is an opening for the passage of air between the end of the furnace and the bridge. *d*, is the dead plate. *e*, is a horizontal division or partition, which divides the ash-pit into two parts, in such manner that, by having doors or slides, the quantity of air admitted below the front and back portions of the bars may be regulated. I have found that this arrangement for supplying air to the ash-pit, when combined with inclined bars, is very important when the draught

is considerable, but the horizontal partition may be dispensed with when the draught is moderate.

Fig. 5, shows a vertical section; and

Fig. 6, a plan in section of another boiler furnace, the ash-pit of which is not divided; in other respects, the combination is the same as in the other figures.

Having thus described the nature of my said invention, and the manner of performing the same, I would state that I am aware that it has before been proposed to use the bars inclining towards the middle of a furnace wherein no bridge or dead plate was used. I am also aware that it has before been proposed to divide an ash-pit horizontally when the bars have not inclined to each other and to the middle of the furnace. And I am also aware that it is not new to use a bridge curved or inclining towards the fire; nor is it new to have a space between the end of the fire-bars and a bridge for the passage of air between them and the bridge. And I mention these matters in order to state that I do not claim any of these parts separately.

But what I claim is, the combination of parts herein described.—In witness, &c.

ABRAHAM POPE.

Specification of the Patent granted to JOHN RUBERY, *of Birmingham, in the County of Warwick, for Improvements in the Manufacture of parts of Umbrella and Parasol Furniture.*—Dated October 6, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention has for its object improvements in the manufacture of those parts of the furniture of umbrellas and parasols which are called the notches of the runners and top notches. Heretofore it has for the most part been usual to cast a ring of brass when making a notch for a runner, which is soldered on to the barrel, and a similar ring of brass with a short barrel is cast; for the top notch the rings are then cut with a groove all round, and the notches for the ends of the stretchers and top tips are made therein.

Now the object of my invention is to improve and cheapen this manufacture by the application of zinc in the making of such notches. For this purpose I prefer to employ sheet

zinc of the thickness necessary, from which I punch or cut discs, from which I punch the centres, thus making rings of zinc suitable for the purposes; and then I pursue the manufacture of the notches in a like manner to that above mentioned when using brass for the like purposes.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

Description of the Drawing.

A, is a washer or ring of zinc, such washer or ring may either be cast or it may be cut out of sheet zinc by fly-press or suitable machinery. I prefer the latter mode of forming the ring or washer. In this washer a groove is cut, as shown at B, or this groove may be cut after the washer or ring has been fixed by soldering it to a barrel, C, also of zinc, or it may be of other metal. The notches are cut and the runner is finished in the ordinary manner. In making top notches, similar rings or washers of zinc are employed, grooves are produced at the edges, and notches made across the grooves, as described in respect to runners, and a suitable tube or barrel of zinc, or of other metal, is soldered in each of such rings, either before or after cutting the groove.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is, the manufacture of the runners and the top notches of umbrellas and parasols of zinc.—In witness, &c.

JOHN RUBERY.

Specification of the Patent granted to JOHN WARD, ***of Saville House, Leicester-square, and*** EDWARD CAWLEY, ***of No. 24, Stanley-street, Chelsea, for Improvements in Chairs, Couches, and Tables.*** — Dated September 10, 1853.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—This invention consists of a peculiar combination of the parts of a chair, couch, or table. The seat of a chair or couch is formed on the front end of a lever-frame, the back

or lower end thereof being hinged or attached to a lower frame or base-plate. The back of the chair or couch is formed at the upper part of another lever-frame, which at its lower end is hinged or attached towards the front of the base-plate or lower frame. The relative position of the seat and back is regulated by the points of bearing (where the frames carrying the seat and back cross each other) being variable, for which purpose one of the lever-frames has necks or axes fixed thereto, and the other lever-frame has notched racks fixed thereto. The base-plate or lower frame may stand on short legs or may have castors applied. In constructing tables, according to this invention, the two lever-frames are combined with the base-plate or lower frame, as above explained, and the lever-frames work together and vary their relative positions, as before described, by which the height of the table, which is connected with the upper parts of the two lever-frames, may be varied from time to time.

Having thus stated our invention, and the manner of performing the same, we will now describe the accompanying drawing, in each of the figures of which the same letters denote the same parts.

Description of the Drawing.

Fig. 1, is a side view.

Fig. 2, a plan.

Fig. 3, a section; and

Fig. 4, a front view of a chair constructed according to our invention. *a*, *a*, is a lever-frame on which the seat, *b*, of the chair, couch, or such like article is formed, the back or lower end of the frame, *a*, *a*, is hinged or attached to the lower frame or base, *c*, *c*; c^1, c^2, are cross-rails to stiffen the frame, *c*, *c*. The back of the chair or couch is formed of another frame, *d*, *d*, its lower end being hinged at *e*, *e*, to the base or lower frame, *c*, *c*; d^1, d^1, are arms or elbow-rests, which may or may not be used as preferred, and may readily be removed by the withdrawal of the screws, d^2, d^2.

The relative angle of the back and seat is governed by the points of bearing, viz., where the frame, *d*, *d*, of the back, and the frame, *a*, *a*, of the seat, *b*, cross each other, such points of bearing being variable, for which purpose the lever-frame, *d*, *d*, has necks or axes, *f*, *f*, affixed thereto, and the lever-frame, *a*, *a*, is provided with racks or notches, *g*, so that

the necks or axes, *f*, *f*, are placed in one or other of the notches, *g g*, so will the back and seat-frames be relatively angled. Although we have only shown our invention as applied to a chair and a table, yet it will be obvious that the same is equally applicable to the construction of couches.

Figs. 5 and 6, show respectively a side and end view of a table constructed according to our invention, the same parts of the table being marked with similar letters to similar parts of the chair, and need not be further described.

Having thus described our invention, and the best means we are acquainted with for carrying the same into practice, we wish it to be understood, that we do not intend to confine ourselves to the precise details given so long as the peculiarity of our invention be retained, but what we claim is, the mode of forming chairs, couches, and tables, as described.—In witness, &c.

JOHN WARD.
EDWARD CAWLEY.

Specification of the Patent granted to JAMES WARBURTON, *of Addingham, in the County of York, Spinner, for Improvements in Preparing Rape Seed Oil.*—Dated October 21, 1853.—(A communication.)

To all to whom these presents shall come, &c., &c.—In a suitable vessel, containing fifty two parts of alkali (caustic soda), of a specific gravity of 1·010, are to be put one hundred lbs. of refined rapeseed oil, these are to be stirred with a wooden ladle, till well mixed. The mixture is then to be allowed to stand twenty four-hours undisturbed, in a cold place. The mixture is then to be warmed slowly, and well stirred up again, after which the liquor is to be left another twenty-four hours, in which time all the oil will have separated itself, but should such not be entirely the case, it can be effected by putting in a small quantity of spirits of wine. The oil thus taken off from the liquor is to be well washed with hot water, till the pure oil is obtained without taste or colour, and, if desired, may be filtered through any suitable filter, as oils have heretofore been treated.

The soap settled in the vessel can be used very pro
for washing purposes.—In witness, &c.

JAMES WARBURT

Specification of the Patent granted to JAMES THOMSON, *of Falkirk, North Britain, for Improvements in Manufacture of Alum.*—Dated October 5, 1853.

To all to whom these presents shall come, &c., My said invention consists in the use of muriate of or muriate of ammonia in conjunction with amm liquor in the manufacture of alum from shale, by m sulphuric acid. I would observe that muriate of pot been long used in the manufacture of alum when mad the common alum schist, as at Whitby and Hurlet, a been found advantageous, both in consequence of be cheapest form of potash salt, and also from decom the sulphates of iron present in the liquors, and re their sulphuric acid available in the formation of th In manufacturing alum from clay, however, this potash has been found unsuitable, as the iron pre inconsiderable in quantity, and if used it would d decomposition of the sulphate of alumina itself. been found necessary, therefore, to decompose it, a vert it into sulphate of potash before using.

In the manufacture of alum from common shale phuric acid, a good deal of iron exists in solution liquors, rendering it a desirable matter to use muri the same reason as in the alum made from schist; existence also of a large amount of free sulphuric hitherto prevented their being employed, as this f disengages the muriatic acid or chlorine in the and rapidly destroys the leaden vessels used in the facture.

I have found, however, that when this manufa carried on according to my process, as described Specification of my Patent for England, for "Impro in the manufacture of Alum," of date December 7, which I use distilled ammoniacal liquor to neutra free acid in the liquors and combine with the sul alumina to form alum, that I can use a certain po muriate of potash or of ammonia with very con

advantage, both in saving the acid in union with the iron and also in preventing a deposit of busic sulphate of alumina. In order to carry out the invention, all that is necessary is to modify my process, as described in said specification, as follows, *videlicet*:—Instead of adding as much ammoniacal liquor as is there described, that is to say, as much as is required to convert the whole sulphate of alumina into alum, I add only about three-fourths of that quantity: and for the remaining one-fourth of alkali necessary, I add muriate of potash, or, if the price admit, muriate of ammonia either in the solid state or in solution, as may be convenient. The exact quantities of muriates and ammonia liquor respectively, however, which should be used in each case will depend on the shale used, and the consequent quantity of iron present. What is necessary to be attended to in carrying out the process is, first, that the quantity of acid used shall bear such a proportion to the alumina which the shale yields that the excess of free acid shall not be more than can be neutralized by the ammoniacal liquor added; and, second, that the muriates used should be as nearly as possible what is required to decompose the sulphates of iron present. What these may be in each case will be found by testing the liquors, as is well understood.

What I claim is, the use of muriate of potash or muriate of ammonia in connexion with ammoniacal liquors (distilled or otherwise), in the manufacture of alum from shale by means of sulphuric acid.—In witness, &c.

JAMES THOMSON WILSON.

Specification of the Patent granted to THOMAS GRAHAME, ***of Hatton Hall, Wellingborough, in the County of Northampton, for Improvements in Building Ships and other Vessels.***—Dated October 13, 1853.

To all to whom these presents shall come, &c., &c.—This invention has for its object three improvements in building ships and other vessels.

The first, where iron or other metal is used for plating, consists in the use or substitution of several thin sheets of metal, in place of using single sheets of a greater thickness; such thinner sheets to be laid together, and having between them layers or sheets of cork, gutta-percha, india rubber,

cloth, paper, or other material, to exclude the action of the atmosphere, and to offer a series of elastic flexible fillings between the several sheets of metal, thus obtaining greater strength and power of resistance, with a diminished weight.

The second improvement consists in the use or substitution of ribs or framings of trough iron, in the place of the angle or T iron now in use, in iron, wooden, or other vessels, in the view of obtaining greater strength, with diminished weight.

And the third improvement consists in covering the bottoms of vessels, whether built of wood or iron, with a smooth vitreous substance, or smooth enamel of any kind, to reduce the friction in passing over and through the water.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

In place of using single sheets of iron of the substance and thickness required, I obtain the strength and thickness desired by laying together several thinner sheets, having between them paper, felt, cork, gutta-percha, or other soft and flexible material, which will keep the several thinner plates at a distance one from the other, and I employ a solution of gutta-percha, or of india-rubber, or other matter suitable for obtaining a close contact of the surfaces, in order to keep the atmosphere from getting between the several plates or sheets of iron. By these means I make up compound sheets, composed of comparatively thin sheets of iron, and flexible and comparatively soft matter, which combinations will be found more useful in ship-building than the use of single sheets, as heretofore practised. And in order to get more strength to the ribs of ships or vessels, in place of using the ordinary angle iron or tee angle iron (T), as heretofore, I employ trough angle iron. And in order to get smoothness of surface to the bottoms of ships or vessels, I employ sheets of iron, coated with enamel.—In witness, &c.

THOMAS GRAHAME.

Specification of the Patent granted to ARISTIDE MICHAEL SERVAN, *of Philpot-lane, in the City of London, for Improvements in Distilling Fatty and Oily Matters.*—Dated September 20, 1853.

To all to whom these presents shall come, &c., &c.—

This invention has for its object improvements in the means now practised in distilling fatty and oily matters, and consists in applying pyramids (by preference triangular ones) of metal at the bottom of the still, and when oily or fatty matters are placed in such still, pumice-stone or other light cellular matter is introduced, and floats on the surface of the fatty or oily matters. Boiling water or steam at low temperature is introduced in a divided state below the surface of the fatty or oily matters. The still is heated by the direct action of fire. By this arrangement the water carries off the heat from the pyramids and prevents the fatty or oily matters assuming a spheridal form by the contact of great heat, and the distillation is carried on under very favourable circumstances. And in order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the process pursued by me.

I use a still of the description ordinarily employed for distilling fatty matters, heated by a furnace beneath, and on the bottom of the still I place pyramids of cast-iron having each of their sides between two and three feet long; by the side of the still there is a small boiler containing water heated by a furnace beneath. From this boiler proceeds a small pipe, say one quarter of an inch in internal diameter, for a still capable of distilling one ton of fatty matter in a day, and of the same relative size for other sizes of stills. This pipe enters and descends to the bottom of the still, where it terminates in a rose, perforated with small holes. The still is connected with a condenser of the ordinary description, and is also furnished with a glass tube to show the level of the liquid within the still, of a similar nature to those used for the same purpose in steam-boilers. The manner of proceeding is as follows:—

The fatty matter is run into the still so as to cover the pyramids to the depth of about eight inches, and on the surface of the fatty matter is placed small pieces of pumice-stone to prevent the fatty matter from being projected over by the escape of the vapour. The furnace is then lighted under the still, and the fat is heated to a temperature of about 400 to 450 degrees of Fahrenheit, which is indicated by a thermometer, the bulb of which is immersed in the fatty matter. A tap is then opened to allow the water to be forced from the small boiler (by the pressure therein,

which should not exceed 5 lbs. on the square inch,) int still, where it immediately flashes into steam.

This steam causes the fatty matter to assume the of vapour, which together with the steam passes to the denser. Care must be taken in conducting this proce introduce more fatty matter into the still, as the qua is diminished by evaporation, so as to maintain always the same level therein.

I would remark that although I prefer to em pyramids of a triangular form, I do not confine m thereto, as the form may be varied without departing my invention.

Having thus described the nature of my improvem and the manner of performing the same, I would h understood that I do not confine myself to the details described.

But what I claim is,

The employment of metallic bodies rising to or fo with points in stills when distilling fatty or oily ma and combined therewith the introduction of boiling or steam at a low temperature, and also the use of floating matters on the surface of fatty or oily m when distilling the same.—In witness, &c.

ARISTIDE MICHAEL SERV

Specification of the Patent granted to GEORGE LAUR *New York, in the United States of America, Dentis Improvements in the Manufacture of Artificial Tee* GUMS.—Dated October 15, 1853.

To all to whom these presents shall come, &c., I construct my plates and arrange the teeth thereon usual manner. I rim my plates on the outer margi also within that portion of the plate which cover alveolar ridge near the base of the teeth to secure effectually the compound and give strength and fir the denture. After the teeth are properly arranged the plate and wax I cover them with a mixture of pla Paris two parts, sand one part, asbestos one par mixed, and water added to make it of the proper consi

for covering the teeth in the usual way. The teeth being thus covered the wax is removed from the inside, and the linings or fastenings arranged upon them; they are then soldered to the teeth with solder or pure gold, after which the plaster and asbestos covering is removed. I now place the denture in the mouth of the patient and place wax or any other convenient substance on the outside of the plate and teeth of sufficient thickness and proper form to bring out the muscles of the face to their original degree of rotundity.

From the wax or other model thus formed upon which the muscles of the face rest, a metallic framework is constructed corresponding; this frame or bulb is then soldered to the plate and united to the teeth by covering it with the silicious compound with which I form my artificial continuous gums. The compound I prefer is prepared in the following manner: silex four ounces, borax two ounces, felspar one ounce, kaolin clay one ounce, asbestos two drachms, caustic potash two drachms, mix these ingredients, reducing them to a fine powder, and fuse in a crucible, pulverize this material and add the same weight of pulverized wedgewood, parian marble, or porcelain tooth body; to every seven ounces of this mixture add one ounce of fine French clock shade or other glass, reduce the whole to an impalpable powder, and it will be ready for use. I mix the compound with sufficient water to bring it to a plastic state, then insert it between and round the bases of the teeth so as to form a continuous gum and also upon the bulb or framework before mentioned, intermixing platina shreds, wire, or gauze, to combine the toughness of the metal with the mineral. I also solder platina scraps, strips, shreds, or wire to the plate above the base of the teeth to secure a firm adhesion of the compound to the plate when fused, thus forming a metallic union between the teeth gum and plate. The gum coloured enamel is made like that usually employed on block work with the addition of sufficient flux to cause it to flow at a lower heat, say 3·200 Fahrenheit. The compound being applied as above and fused in the muffle of a furnace is then withdrawn and cooled slowly. The gum or flesh-coloured enamel is applied and fused in the same way.

Having thus stated the nature of the said invention, I will proceed to describe the manner of performing the same.

The first part of the invention consists of using asbestos in combination with sand and plaster of Paris, in place of plaster of Paris and sand alone, when covering the teeth after they have been set in wax on a metal plate. The addition of asbestos materially improves the compound, and when subjected to heat with a view to melt the solder to fix the teeth to the metal plate will retain its form and tend to prevent the plate getting out of its correct figure. The manner of use of the composition containing asbestos is the same as that heretofore practised when using plaster of Paris and sand without the asbestos, and will not, therefore, require further description.

The second part of the invention consists of obtaining or forming the gums or parts of gums in combination with the use of a metal plate with teeth affixed thereto, such gums, according to the invention, being composed of a vitreous compound above described, to which compound I make no claim separately. In carrying out this part of my invention a metal plate is to be formed as heretofore, and the artificial teeth are to be fixed thereto, as has heretofore been practised, whether by the mode above described, or by soldering pins to the plate and fixing tube teeth thereon, to neither of which modes of fixing artificial teeth to a metal plate, nor to the making of the plate itself, do I make any claim. The artificial teeth I use are what are called mineral teeth, but whatever teeth be used for the purposes of this invention they require to be such as will bear a heat sufficiently above that at which the composition for making the gums will flux and run at to ensure their not being injured by the heat applied in producing the gums on the plate and teeth. A plate and teeth having been made and combined as above explained, this part of my invention consists of forming gums on the plate, and at and around the roots or lower parts of the teeth where they are fixed to the plate by using by preference the vitreous compound above described. This forming of the gums is readily performed by the hands with modelling tools, and having formed the gums with the plastic matter it is allowed to dry and to set, and then is subjected to heat so that the vitreous enamel will adhere to the metal plate and to the lower parts of the teeth and will form artificial gums thereto of a very cleanly description. In applying heat care is to be taken that the raising and also the lowering the temperature be done gradually. The vitreous compound above mentioned may

be varied, but I believe that which is above given to be the best for the purpose, and the same will have colouring matters mixed therewith, as similar vitreous compounds heretofore have had when used in making mineral blocks, sometimes called gum teeth, wherein metal plates and artificial teeth are not combined.

Having thus described the nature of the said invention, and the manner of performing the same, I would have it understood that,

What I claim is,

First, the use of abestos as herein described, and,

Secondly, I claim the forming of artificial gums to artificial teeth fixed to a metal plate.—In witness, &c.

GEORGE LAURIE.

Specification of the Patent granted to WILLIAM MOSELEY, *Architect, of Cumberland-terrace, Regent's Park, for the Invention of A New Method of Railway Traction, to be called a Pony Railway.*—Dated April 8, 1853.

To all to whom these presents shall come, &c., &c.—My invention has reference more particularly to lines of railways the limits of whose length are such as will enable the carriages or trains running thereon (where a single line of rails is employed) to make the journey to the terminus opposite to the one started from and back again in as short a time as the interval between the starting of the trains. In carrying out this system, I employ two or more tubes, known as atmospheric tubes, laid parallel to and between the rails, for the purpose of supplying traction power to the carriage or carriages composing the train, one such tube being in course of exhaustion whilst the other is employed in the propulsion of the train, so that on its arrival at the termination of the line it may be set in motion on the back journey without being turned round or removed from the rails, the connexions of the carriages with the tubes having been previously shifted from the tube just used to the one which in the meantime has been exhausted. The method of disconnecting the carriage or carriages from any one tube, and connecting them with another, is as follows:—Attached to the piston working in the tube, and acted upon by the pressure of the atmosphere therein, is a

coulter or rod, which passes through the longitudinal valve or opening on the top of the tube; the end of this coulter, outside the tube, has a socket formed in it, into which the rod that connects the carriage with the propelling piston is dropped, and secured therein by screws, or bolts, or staples, or catches, or other fastenings. On shifting the "connexion" from one tube to another, the connecting rod is raised by a screw or lever from the socket; it is then moved by a second screw, or by a sliding bar and blocks, or by a lever or levers, to a position immediately over the similar socket of the coulter of the piston in the tube by the atmospheric pressure in which it is desired that the carriage should be propelled. The connecting rod is then lowered or dropped into this socket, and secured therein; the carriage is then ready to be propelled in the opposite direction, without being turned or removed from its position on the rails.

Where intermediate stations are necessary, two other separate lines of tubes are laid down for the traffic of each of such intermediate stations; these tubes are continued to the terminus in either direction from the station. The carriages or trucks for conveying passengers, goods, &c., to these intermediate stations, run upon the same rails as the through carriages, and are arranged in the same serial order as the stations at which they are to be dropped. For the purpose of expediting the taking up and setting down of passengers, &c., the carriages are liberated from the train, at their respective stations, without impeding the progress of the general line of carriages.

In order to ensure perfect security in so separating the carriages, (provided the usual mode of stopping at each station and putting the carriages in motion again be not adopted,) the apparatus for effecting such liberation is situated at such distance from the station at which the carriages are to stop as will enable them, when disconnected from the propelling pistons, to gradually lose the momentum they have acquired on their journey, and to be brought to rest by breaks, if necessary, at the platform of the station. The arrangement of apparatus for disconnecting the carriages from the pistons is as follows:—The rod which connects the carriage with the propelling piston fits into a socket formed in the end of the coulter of the piston, and is provided with a pair of elevating rollers, having their axis or shaft parallel with the axles of the carriages.

At such distance from the station at which the carriage or carriages is or are to stop, as will by trial be found necessary, is placed a second pair of rollers, working in bearings fixed above the tube. These two pairs of rollers are so relatively adjusted as that, on the arrival of the carriage at the liberating apparatus, the rollers attached to the connecting rod shall be elevated by their passage over the fixed rollers, and consequently at the same time raise the rod to which they are attached from out of the socket in the coulter, thus disconnecting the carriage from the propelling piston, and allowing it to be stopped at the platform of the station; or the carriage may be brought to rest by allowing the vacuum to be gradually destroyed in front of the piston, by admitting air through a valve in the tube at the station, acted upon by a balance weight and lever, fixed at the requisite distance from the station, and put in motion by the passing train; or the valve may be actuated by the apparatus known as the lazy tongs, in place of the balance weight and lever. In like manner, by the use of the lazy tongs or balance weight and lever, acted upon by the coming train, the carriage or carriages left at the station on the previous journey, and which has or have in the meantime taken up passengers, &c., may be liberated from their holdings, and allowed to acquire sufficient velocity before they are overtaken by the coming train, of which they are to form a part, as will prevent any violent impact or collision between them. By these means no time is lost by the stoppage of the through train at the intermediate stations, either for the setting down or taking up of passengers, &c.

Where two or more lines of tubes and rails are employed, the starting of the trains may take place interchangeably.

And having now described the nature of my said invention, and in what manner the same is to be performed, I declare that I lay no claim to any part of the machinery individually considered; but that what I do claim as my invention is the general arrangement and combination of machinery or apparatus, as above described.—In witness, &c.

WILLIAM MOSELEY.

Specification of the Patent granted to GEORGE EDWARD DERING, *of Lockleys, in the County of Hertford, for Improvements in Galvanic Batteries.*—Dated October 27, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists in the use of an acid solution in contact with the negative elements of batteries having an exciting liquid composed of a salt or without free mineral acid applied to the positive elements. In dividing the cells of batteries, porous divisions of earthenware or other material are used in troughs or vessels composed wholly or partly of gutta percha, or india-rubber, or compounds containing such materials. The use of lead as a negative element with a suitable positive element; and the use of iron as a positive element with a suitable negative element, in batteries for working electric telegraphs or clocks. And to prevent evaporation in telegraph batteries I close them air tight.

Having thus stated the general nature of my improvements, I will proceed to give a further description of the same, which will be better understood if I state that the object of most of the arrangements described is to render galvanic batteries more permanent in their working than heretofore, though at the same time energetic in action, and to derive from them regular and constant currents of electricity for long periods of time, without attention or renewal; and to reduce the consumption of materials, and the working expense generally.

With reference to my method of exciting batteries by an acid solution in contact with the negative elements, and an exciting liquid composed of a salt or without free mineral acid applied to the positive elements; the two liquids being separated by a porous division, or other suitable means; it has been common to apply acid solutions to both the negative and positive elements, but it is found that however weak the acid solution may be, and notwithstanding that the most efficient means be adopted to protect the positive element from the acid, there is yet a destructive chemical action exerted upon it, which causes a rapid consumption of the metal; and being irrespective of the galvanic effect, it continues when the circuit is incomplete, and the battery producing no useful effects.

Another method in common use consists in exciting both the negative and positive elements by solutions of salts, or other weak liquids, and the objection to this principle is the feebleness of the result obtained from such batteries. I find that, by the use of different liquids, in contact with the positive and negative elements, as I have described, a current of considerable energy is obtained, and, at the same time, all destructive action upon the positive element is avoided, except that immediately connected with the galvanic effect; and the battery may be kept ready for immediate use for an indefinite period without any consumption of materials occurring until the circuit is completed. Various forms of battery may be worked upon this principle, and many different liquids may be employed. I have derived good results from the use of negative plates of copper, or platinized silver, and positive plates of zinc, which may be amalgamated with mercury in the usual manner, the former being excited by hydrochloric acid diluted with from five to ten parts of water, and the latter by plain water, or sea water, or a solution of common salt, or of chloride of zinc.

The application of porous divisions to battery cells or troughs of gutta percha or like materials, forms an efficient arrangement for carrying out the principles last described, as well as for various other kinds of batteries. I am aware that porous divisions of different materials have been applied to vessels of earthenware, and of wood rendered waterproof by cements; but I find that they may be applied with great advantage to cells or troughs of gutta percha, and very durable battery vessels thus formed.

I have found considerable advantage in the use of the metal lead as the negative element in batteries for purposes such as I have named, where long-continued action is required, in consequence of it being but slightly acted on by exciting liquids, which have a destructive action upon copper, the metal ordinarily employed. In solutions of salts of ammonia, for instance, a plate of copper is quickly corroded, and in a short period eaten away; but a plate of lead will remain for years almost intact. And it has the advantage of being a very cheap metal, although possessing in galvanic combinations many of the valuable qualities of silver or platinum.

A battery of very great constancy may be formed by the use of a solution of acetate of lead in contact with lead

negative-plates, and zinc positive-plates, separated by a porous division, and excited by a weak solution of common salt, or other suitable liquid. Or copper-plates may be thus arranged in the acetate of lead solution, and they quickly acquire a lead surface by a deposit of the metal, when the circuit is completed.

In the use of iron as a positive element in batteries, I prefer malleable iron, and I employ it in the same manner as zinc is ordinarily used. It produces a very efficient galvanic current for such purposes as those for which I propose its use, although less powerful than that from zinc plates, under similar circumstances; but it has the advantage that most of the existing liquids commonly employed have, but little action upon it when the circuit is not complete. And it is not subject in so great a degree as zinc to the destructive effect, known as "local action." Being much cheaper than zinc is another recommendation. It may be associated with most of the negative elements in ordinary use; I have derived good results from couples of copper and iron, excited by a weak solution of sulphuric acid, and the two plates separated by a porous division.

The principle of closing telegraph batteries air-tight, so as to prevent the evaporation of the liquids which they contain, is susceptible of various modes of application. But the plan which I prefer consists in employing cells or troughs of gutta percha to contain the liquid and plates, and covers of the same material, firmly attached with close joints by the aid of heat and proper cements, as is well understood in manipulating this material; and I prefer that each cell of a compound battery be thus closed independently of the others. In batteries required to continue in action, or ready for action, for long periods of time, a cessation of effect frequently takes place in consequence of the liquid having evaporated and left the plates dry, but by the means which I have described this is altogether prevented, and the battery will continue in efficient work until its electrical properties are exhausted.

Having thus described the nature of my invention, I wish it to be understood that I do not confine myself to the details contained herein.

But what I claim is,

First, the use of acid solutions in contact with the negative elements of batteries having any suitable exciting

liquids not composed of free mineral acids applied to their positive elements.

Secondly, the application of porous divisions of earthenware or other material to troughs or cells or vessels, wholly or partly constructed of gutta percha, or india-rubber, or like materials, or compounds containing such materials.

Thirdly, the use of lead as a negative element with any suitable positive element and any suitable exciting liquid or liquids, in batteries for working electric telegraphs or clocks.

Fourthly, the use of iron as a positive element with any suitable negative element and any suitable exciting liquid or liquids, in batteries for working electric telegraphs or clocks; and

Fifthly, the rendering air-tight by any suitable means batteries employed for working electric telegraphs.—In witness, &c.

GEORGE EDWARD DERING.

Specification of the Patent granted to JOSEPH FRY, *of* 19, *Cannon-street West, in the City of London, Merchant, for Improvements in Preparing Solvents for India-Rubber and Gutta Percha, and in rendering Waterproof Fabrics free from Odour.*—Dated November 15, 1853.

To all to whom these presents shall come, &c., &c.—Heretofore the solvents employed for india-rubber and gutta percha have been distilled and rectified, but I have found that these solvents are improved if india-rubber or gutta percha be combined therewith before or be present when distilling and rectifying them; and my invention consists of dissolving india-rubber or gutta percha in solvents before, and of introducing india-rubber or gutta percha into the still when distilling or rectifying the solvents. And in order to deprive waterproof fabrics of the odour consequent on the use of solvents, the fabrics are placed in a steam-chest, and subjected to the action of free steam, the upper parts of the steam-chest being coated with layers of flannel to prevent condensation.

Having thus described the nature of my said invention, I will proceed to describe the manner of performing the same.

In carrying out the first part of my invention I introc india-rubber or gutta percha with the solvent into a and then distil over the solvent; and I find that from to six ounces of india-rubber or gutta percha (accordir the state of impurity of the solvent) dissolved in each g is sufficient for the purpose. The distillation in c respects is carried on in the ordinary manner, and as is understood, by which the product distilled over wil found materially improved for the purpose of its us dissolving india-rubber or gutta percha; and the re in the still will be found useful for fabricating comm inferior articles, and for waterproofing coarser and l class cloths. The solvents usually employed for such poses are turpentine and coal naphtha, or coal oil; either of these may be taken in the crude state, and dissolved therein india-rubber or gutta percha, and distilled; or the crude solvent may be distilled—first, wit india-rubber or gutta percha being present, and afterw be combined with india-rubber or gutta percha, and a distilled or rectified. The latter mode of treatment, believed, produces the best result.

I will now proceed to describe the second part o invention, which has for its object the removal of the o of articles fabricated of india-rubber or gutta percha which solvents have been used. For this purpose I em a close chamber, of a size depending on the quanti goods or articles fabricated of india-rubber or gutta pe in which solvents have been used to be subjected to process at one time: and I would state that it is desi that the waterproof cloths, whether before or after b made up into garments or other articles, and other forn waterproof fabrics, should be kept as open and separat may be, in order to admit as much as possible of the and free action of the steam on all parts of the surface prefer that the steam-chest or chamber should be of but do not confine myself thereto, with convenient doo one end or side for the passage of persons to suspen otherwise place the articles therein; the upper part o chamber is open, but coated over with one or more c ings or layers of flannel, to partially restrain the pass steam, and to absorb any steam which may condense the and it is desirable also to line the whole interior with fla which I prefer to be dry, at the commencement of the cess. The steam is introduced at the bottom of the st

chest or chamber by means of perforated steam pipes, and the pressure of steam which I employ is only slightly above that of the atmosphere, but higher pressure steam may be used. I have, however, not found it necessary to do so. By thus subjecting articles, whether made by the use of india-rubber or gutta percha, to the action of free steam, the odour of the solvent used will be removed in a longer or shorter time, depending on the quantity of the odour of the solvent which remains in the articles.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is,

First, the distilling solvents of india-rubber and gutta percha with those matters present or combined therewith; and

Secondly, I claim the subjecting waterproof fabrics to the action of free steam, to remove the odour thereof, as herein described.—In witness, &c.

JOSEPH FRY.

Specification of the Patent granted to BRYAN EDWARD DUPPA, *of Malmaynes Hall, in the County of Kent, Gentleman, for Improvements in Colouring Photographic Pictures.*—Dated November 3, 1853.

To all to whom these presents shall come, &c., &c.—Heretofore photographic pictures have been coloured by an artist, by placing colours on the front surfaces, in varying tints, and according to the effect desired to be obtained, requiring great skill to produce good coloured pictures. Now my improvements consist of rendering the front surfaces transparent with suitable varnish, and applying colours to the back surfaces. By which means the laying on of the colours will not require that artistic skill heretofore necessary, and results are obtained which cannot be obtained by the colouring on the front surface. Having thus stated the nature of my said invention, I will proceed to describe the manner in which the same is performed.

A photographic picture having been obtained on suitable material in the usual manner and as is well understood, in place of applying the colour to the front surface (the surface

presented to the eye of an observer) as heretofore, by which much of the beauty and exactness of a picture is coloured over and hid, by my invention the colour is applied to the back (that is, the opposite surface to that which is presented to the eye of tbe observer) of the photographic picture, so that the colours are behind the picture, and are seen through the material on which the photographic picture is taken, the material itself for that purpose being transparent, so as to show the colour through the material and through the photographic picture. By which means of applying colours the photographic pictures, in place of being, more or less, covered and hid by the colours, as heretofore, are presented complete to the eye, and the observer sees the colour through and not on the front surface. And I would state that, although I believe that paper is the best material for photographic pictures, when coloured, according to my invention, I do not confine myself thereto. An image having been obtained on paper in the usual manner and as is well understood, a coating of wax varnish, or material, is applied to the front surface thereof, to render the same transparent: for this purpose I prefer melted wax or mastic varnish, though other transparent varnish may be used. The paper being rendered transparent by the wax or varnish applied to the face or front surface of the picture, I next apply the colours to the back of the picture: and for this purpose I prefer to employ oil colours, though others may be used; and I apply the local colours by means of a brush, which simply requires care to keep them to the proper localities; thus, supposing the picture to be that of a person, the face and hands would have a uniform tint of flesh colour applied to the back of such parts of the picture as those portions of the person occupy, for, excepting, in some cases of very florid complexions, and where the red and white are very distinctly marked, two or more tints of a colour will not be necessary. In like manner, so much of a dress as consists of one colour, would have that colour applied thereto at the back of the picture, and the same colour is to cover the locality of the picture actually occupied by the dress, and so on in regard to other parts of the picture; the lights and shadows of the photographic picture producing the necessary lights and shadows of the colours so laid on uniformly at the back. The colours having been applied, as above explained, I cement the back of the picture to a surface of card-board or other material, and, for this purpose, I

prefer to use white lead, spread over the card-board or other surface; and, finally, I again varnish the front of the picture, if required, to bring all parts well out. If it be desired that the coloured picture should represent a reversed image in regard to that shown by the photographic picture, then the local colours are to be placed on what may be termed the face of the photograph image, the paper being rendered transparent, as before explained, the photograph image will then be seen through the paper, and the colours through both. The front of the coloured picture, thus produced, will have all the character of those previously described, but the image will be reversed.

Having thus described the nature of my said invention, I would have it understood, that I do not confine myself to the details herein described; but what I claim is, the colouring photographic pictures, by applying colours to the surfaces which constitute the backs of the finished pictures.—In witness, &c.

BRYAN EDWARD DUPPA.

Specification of the Patent granted to THOMAS DE LA RUE, *of Bunhill-row, for An Improvement in the Manufacture of Paper.*—Dated November 12, 1853.

To all to whom these presents shall come, &c., &c.—This invention has for its object to improve the manufacture of paper by applying zinc-white, which I find gives to paper a peculiar character. And the improvement consists of combining zinc-white with pulp, used in the manufacture of paper.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

The object of my improvement is to produce,—

Firstly, a paper well adapted for writing upon from its being free from that greasiness of surface so unpleasant, and which is often experienced in many descriptions of writing papers.

Secondly, to produce a paper particularly well adapted for either copper-plate, lithographic, or letter-press printing on account of the great facility with which it receives the impression even without previous damping; and

Thirdly, for the production of a paper to be used for the leaves of the so-called metallic or indelible memorandum-books, to be written upon with a metallic style.

My invention consists in introducing into the pulp to be used in the manufacture of paper zinc-white, known also by the names of oxide of zinc and flowers of zinc, and now commonly sold in commerce. Before using this substance I grind it to a fine pulp with water, using for that purpose a horizontal or other mill. I employ the oxide of zinc, usually in quantities varying from five to fifty parts of dry oxide to 100 parts of dry pulp, and I add thereto alum, in the proportion of one part to every five parts of oxide of zinc, but I do not confine myself to these proportions. I introduce the oxide of zinc through a strainer, and the alum in solution, into the beating-engine along with the requisite quantity of pulp in a partially beaten state, having previously shut off the stream of water, and I cause the action of the roll to be continued for two hours, or until the oxide of zinc is thoroughly incorporated with the pulp. When this is effected the compound pulp is run into the chest and kept continually in motion by the agitator, so as to prevent the deposition of the oxide of zinc. In employing this pulp containing oxide of zinc for machine-made papers, it is usually necessary to diminish the speed of the wire, and especially when a large quantity is used, as the water does not run away so freely as from ordinary pulp, and the pulp "works wet:" I, however, find that the employment of two vacuum-boxes, the one before and the other after the dandy-roller, facilitates the removal of the water, and I usually cause a somewhat less vacuum to be maintained in the first than in the second vacuum-box.

I would remark that more care than ordinary is required on the part of the workman in regulating the speed of the wire, but at the same time the difficulties are readily overcome by attention.

I would state that the quantity of zinc-white used for printing papers depends on the quality or absorbent character of paper desired to be obtained; and I use for printing papers from five to fifty parts of dry oxide of zinc to 100 parts of dry pulp. I find that the more oxide of zinc which can be introduced without making the paper too tender the better the printed impressions obtained. In writing papers from ten to twenty parts to 100 parts of

pulp are preferred, and metallic-books I use from thirty to upwards of fifty parts of oxide of zinc to 100 parts of pulp.

I would here state that I am aware that in a specification of a patent granted to my son and partner, Warren De la Rue, a claim is made for the application of oxide of zinc on to the surface of manufactured paper and card-board; I do not, therefore, claim such an application of oxide of zinc;

But what I do claim is,

The incorporation of oxide of zinc with pulp in the process of manufacturing paper.—In witness, &c.

THOMAS DE LA RUE.

Specification of the Patent granted to CHARLES GOODYEAR, *of Avenue-road, St. John's Wood, in the County of Middlesex, for Improvements in the Manufacture of Pens, Pencils, and Instruments used when Writing, Marking, and Drawing.*—Dated July 15, 1853.

To all to whom these presents shall come, &c., &c.—This invention consists of the employment of india-rubber (caoutchouc) in constructing or making pens, pencils, and instruments used when writing, marking, and drawing. I combine india-rubber with sulphur, with or without other matters, and subject the same to heat to obtain a hard substance. I also combine slate powder or matters with india-rubber, and thus obtain sheets or surfaces. And I form or make the articles, or parts of the articles, above mentioned by employing such compounds.

Having thus described the nature of the said invention, I will proceed to describe the manner of performing the same.

In manufacturing pens according to this invention, I cause india-rubber to be combined by kneading it with sulphur or matters which contain or will give off sulphur when subjected to heat, preferring, however, to use sulphur; and, as is now well understood, I combine these matters in the proportions of two parts by weight of india-rubber, and one part by weight of sulphur. I roll out such compound into a thin sheet, say of the thickness of a strong quill.

This sheet I cut up into narrow strips of a width suitable for making pens, and I subject the same to heat for about six hours, in order to convert the compound into a hard substance suitable for pens, preferring to do so between two surfaces of glass, the one concave and the other convex, by which the process of conversion will be performed whilst the matter is held in the form it is desired to be for making of pens, and it will retain such form afterwards. I have found that the best means of applying the heat is by means of a bath of water in a strong vessel suitable to bear the pressure; but I do not confine myself to such mode of applying heat, as other means may as heretofore be resorted to when making the articles of like compounds.

The strips of india-rubber and sulphur compound being held and retained between glass surfaces, such as above described, are placed in the bath, and the temperature is gradually raised, say to 230 degrees of Fahrenheit, in about half an hour; and at this temperature the heat is to remain for about one and a half hours; the heat is then again to be raised gradually to about 295 to 305 degrees Fahrenheit during the remainder of six hours, when the compound and the glass moulds or surfaces are to be removed and allowed to cool. The composition, on being taken from the glass, will be suitable for being cut into lengths for making pens; and the material thus produced is capable of being made into pens by cutting instruments, such as are used for making pens out of parts of quills, as is well understood.

I would remark, in respect to this part of my invention, that I make no claim to the production of hard substances, such as I have above described, by combining india-rubber and sulphur, and subjecting such compound to heat; neither do I confine myself to the precise details herein given when applying such substance to the manufacturing of pens; and, although I prefer the simple compound of india-rubber and sulphur, I do not confine myself thereto, as other matters may be mixed therewith.

But what I claim is, the manufacture of pens from the hard substances produced by combining india-rubber and sulphur, with or without other materials.

The second part of my invention consists of combining the powder of slate or of porcelain for white slates with india-rubber and sulphur, in order to produce surfaces suitable to be written on with ordinary slate-pencil, and for making artificial slate-pencil. For these purposes I com-

bine a quantity of the powder of slate or of powdered porcelain for white slate with the above-mentioned compound of india-rubber and sulphur, by kneading these matters together, and I apply as much of the slate powder as the compound will take (different qualities of india-rubber will take more or less than other qualities), and yet retain a plastic state, such as to admit of the same being rolled into a sheet; and sheets so made I cause to be subjected to heat, in the same manner as I have above described, but using flat plates or sheets of iron (with tin-foil between) by preference for retaining the compound in form during the process of heat. In this manner may artificial slates be made which are not liable to be broken by the ordinary use to which such writing surfaces are usually subjected. When this compound is to be used as an instrument for writing with on slates, or on artificial slates, the same is to be cut into suitable forms for the purpose.

What I claim, in respect to this part of my invention, is, the manufacture of artificial slates and slate-pencils herein described.—In witness, &c.

CHARLES GOODYEAR.

Specification of the Patent granted to CHARLES GOODYEAR, *of Avenue-road, St. John's Wood, in the County of Middlesex, for Improvements in the Manufacture and Ornamenting or Coating of Articles when Compounds containing India Rubber are used.*—Dated August 13, 1853.

To all to whom these presents shall come, &c., &c.—This invention has for its object the making articles compounded of india-rubber and sulphur, with or without other matters, with a view to their being subsequently coated in parts or wholly by deposits of metal by the aid of currents of electricity. For this purpose the articles are to be made of india-rubber and sulphur, with or without other matters, and subjected to heat to convert them, as is now well understood, and in order to render the surfaces or parts of them suitably conductive for receiving deposits of metal, in some cases they are coated with plumbago or with powdered metal, and in other cases metal is to be let or driven into the parts of the surfaces of the articles, and deposits of

metal or metals are then obtained by currents of electricity obtained from any suitable source and in like manner to that in which electro-deposits are obtained on metallic and other surfaces.

Having thus stated the nature of my said invention, I will proceed to describe the manner of performing the same.

The object of this invention is to obtain ornament or coating of metal to articles made of india-rubber combined with sulphur and with or without other matters. It is now well known that articles of various kinds may be made by moulding, and otherwise, of india-rubber combined with sulphur; which when subjected to high temperatures are subject to a change by which the articles, which when made were in a plastic state, become hard and very enduring of rough usage. In some cases articles may be made by casting, whether hollow or solid, in one piece; other articles may be made by casting, or otherwise, in parts, and may be put together and then subjected to heat; other articles may be made out of the hard substance, after the change by heat has been obtained.

The making, however, of such articles forms no part of my present invention except so far as concerns the preparing them for and subjecting them to the action of electric currents when in solutions of metals. It will not, therefore, be necessary for me to enter in this specification into any description of the making and treating such articles in order to convert them, when formed, into the hard substance which results when applying heat to india-rubber properly combined with sulphur, but I may state that I have in my specifications to former patents given very full particulars thereof. In preparing articles made of the hard material above mentioned, in order to receive electro-deposits of metal on such parts of the surfaces as it is desired to coat or ornament with metal, such surfaces must be rendered conductive. This may be done in various ways: if the whole exterior and interior surfaces be desired to be coated, the most simple mode of making the surfaces conductive is by obtaining a coating of plumbago or powdered metal to such surfaces; this may readily be done by dusting the same over the matter when in a plastic state and pressing it into the surfaces when moulding, and by retaining the same in moulds till the process of heat has been performed; the whole or any portion of the surfaces of

the articles may by such means be made conductive of electricity and consequently suitable to have electro-deposits of metal made thereon: and in addition to so applying plumbago or other metal and pressing it into the surfaces, some plumbago or powdered metal may be combined with the india-rubber when in a plastic state, or I combine the plumbago or powdered metal with india-rubber cement and apply a coating or coatings to the surfaces or parts of the surfaces where electro-deposits of metal are to take place. I have also found it desirable, particularly when electro-typing parts of an article made of the substance above described, and which has been subjected to heat to get the parts conductive of electricity, by driving in pins of metal about the parts desired to be coated in addition to applying plumbago over the surface, according to the device desired to be obtained in deposited metal, by which means the coating of metal which is produced will be held secure by reason of the pins. The making of electro-deposits of metal on to metal surfaces and on to surfaces rendered conductive of electricity being well understood it will not be necessary for me to enter into any description thereof, and separately the same is not of my invention. The surfaces of metal obtained on such articles may be polished or engraved or otherwise treated, as is well understood, in order to obtain the finished result desired.

Having thus described the nature of my said invention and the manner of performing the same, I would have it understood that,

What I claim is,

The ornamenting or coating articles composed of india-rubber and sulphur, with or without other matters, by electro-deposits of metal thereon.—In witness, &c.

CHARLES GOODYEAR.

Specification of the Patent granted to FREDERICK SPIEKER, *of New York, in the United States of America, Professor of Chemistry, for Improvements in Generating and Fixing Ammonia.*—Dated July 25, 1853.

To all to whom these presents shall come, &c., &c.—It is well known to chemists that ammonia consists of a

combination of nitrogen and hydrogen, and that ammonia is usually procured by the decomposition of animal matters which are known to contain these ingredients. The present invention consists in obtaining ammonia by the decomposition of various other matters known to contain the elements of which ammonia is composed, *videlicet*, hydrogen and nitrogen. Water, or any substance containing water, is the substance I propose to employ for obtaining the hydrogen, the nitrogen, or other element of ammonia being obtained from the atmosphere, which it is well known consists of oxygen and nitrogen; the decomposition of water will, therefore, free the hydrogen, and the air will supply the nitrogen required. The decomposition of the water is caused by some chemical agents which will combine with the oxygen contained in the water, leaving the hydrogen of the water free to combine with the nitrogen of the air, and thereby form ammonia, which being volatile is condensed, and afterwards fixed by some other and well-known chemical agents. Supposing the ammonia when obtained is to be employed in the manufacture of manure, silicates of alumina, or peat-charcoal, either alone or in combination with other substances which are fertilizing agents, are the substances which I prefer to employ for absorbing or condensing the ammonia. For fixing the ammonia when obtained I employ either of the well-known acids, or salts containing such acids, and which will readily decompose in the presence of ammonia. In some cases I employ chalk, shells, lime, or fossil remains in combination with the above process for obtaining ammonia, as I have found by experiments that as these substances contain animal remains they will greatly assist in producing the ammonia and increasing the quantity thereof, which circumstance may, perhaps, arise from the fact of these substances containing remains of animal matters which, as before mentioned, are composed to a great extent of some of the elements which form ammonia.

In order to generate ammonia according to my improved plan I effect the decomposition of the water, either by means of metallic iron, or the protoxide of manganese or of iron. Cast-iron as well as wrought-iron answers equally well for this purpose, but it is very advisable to use it in thin or small fragments, so as to offer as large a surface as possible to the air and water for oxidation. Scrap iron, broken vessels of cast-iron, or other articles made of iron, will, therefore, answer the purpose. Ammonia being highly

volatile must, when obtained, be absorbed and condensed, for which purpose I find that for agricultural purposes gypsum or sulphate of lime, and also the different kinds of aluminous earths; for instance, the silicates of alumina are the substances to be preferred for condensing the ammonia, particularly the aluminous earths, as they possess this quality in a high degree when used in a finely powdered state, either alone by themselves, or mixed with finely ground charcoal or peat-charcoal.

The silicates of alumina which I prefer to use are those generally known as potter's or plastic clay, clay-slate, green sand, and other matters, which contain a considerable quantity of alumina. These matters will condense the ammonia with great facility when they are in a finely powdered state, after having been mixed with water or organic matter, and subjected to evaporation. Ammonia, either when it has been generated from the direct combination of its elements as above mentioned, or when it has been produced by the decomposition of organic matter, may be condensed by these silicates of alumina.

The ammonia must be condensed immediately it is formed; that is to say, it must come in its nascent state in contact with both the condensing and fixing materials. The iron scraps must be well mixed with the finely ground aluminous earth, and spread out in thin layers on a place where a free circulation of air can take place, as the contact of the air is of material consequence to the success of the process. The proportion of iron to the mass of aluminous earth is of no particular consequence, the more iron is used the better for a quick generation of ammonia; still there is a limit, for the iron ought to be everywhere equally covered with a thin layer of aluminous earth. The easiest way to prepare the mixture of the substances is to lay down a layer of the aluminous earth, previously mixed with water and some suitable acid such as those hereafter named, to the consistence of a thin paste; lay the iron scraps in it, and cover them up with another thin layer of aluminous earth in a state of paste.

The mass is then left to be evaporated gently, either by the heat of the atmosphere in summer or by very gentle artificial heat. Particular care should be taken that the evaporation goes on slowly, and that if the above process be carried on in the open air the rays of the sun do not fall directly upon the mass under operation, as too great solar

heat, at least such as that of the summer sun in America, will act very injuriously upon the success of the process, as the heat will be found to evaporate the ammonia before it can be absorbed and fixed. The process may be carried on in the shade by providing a simple roof of boards open on all sides, and care should be taken to prevent rain from falling on the mass and washing out the salts of ammonia. After the evaporation has reduced the mass of iron, aluminous earth, water, and acid, or other materials to dryness, they should be moistened again with water. This may be repeated a second time if there should be undecomposed salt of iron yet in the mixture. The mass should be again turned over so as to expose the materials freely to contact with the air, in order to secure the entire decomposition of the acid. After this the operator can easily detect, by applying a test in the ordinary manner or by the smell, the presence of a considerable quantity of ammonia in the mixture. The easiest way of testing for the ammonia is by subjecting a handful of the aluminous earth, freed from the iron scraps, to the action of a strong solution of caustic potash or freshly prepared hydrate of lime, which must be well mixed with the aluminous earth, after which a glass rod, moistened with muriatic acid diluted with a little water, must be held over the aluminous earth, when the presence of ammonia will be indicated by the fumes of sal-ammoniac, caused by the gaseous ammonia coming in contact with the muriatic acid.

If it is desirable to make the layer of aluminous earth richer in the salt of ammonia, it is again moistened with diluted acid, and the same process of evaporation repeated for as many times as it is judged desirable, so that it should contain an increased proportion of ammonia. Another layer of earth and iron is then put upon the first, and the layers increased to any desired thickness. The pieces of scrap iron can be used repeatedly till they are entirely converted into the peroxide of iron, it being only necessary to separate them by sifting, or in any convenient manner, from the aluminous earth which contains the salts of ammonia when the aluminous earth is deemed rich enough in alumina. The aluminous earth and iron may be laid for the evaporating process upon plates of iron or flat flag-stones, or upon a layer of plaster of Paris placed on boards, or even boards alone, although the latter will, of course, in the beginning, absorb a good deal of the salts of ammonia. As

regards the choice of acid to be used in the mixture with the iron and aluminous earth, this is to be decided by the price of the different acids, and their efficacy. I have produced the salt of ammonia by this process, both by organic acids, as, for instance, acetic acid (vinegar), as well as by inorganic acids, such as muriatic acid or sulphuric acid; for practical purposes I would, however, prefer sulphuric acid on account of its cheapness and its great affinity for ammonia. If the locality is favourable, humic acid, if contained in the extract made from turf or muck, may be also employed, either alone by itself or together with sulphuric acid, or if the process is carried on near the sea-shore, the use of sea-water for the oxidation of the iron in combination with an acid will be found of great advantage. If strong acids, like muriatic or sulphuric, are used, they must be previously highly diluted with water. Of sulphuric acid of commercial strength I use generally about two to three ounces to a gallon of water.

In the place of the metallic iron for generating ammonia, the sulphate of iron, or the protoxide of iron, or the protoxide of manganese may be used with success. Any of the proto-salts of iron will produce this effect, but for practical purposes I prefer either the proto-chlorate or the proto-sulphate of iron, generally the latter. Of the green copperas of commerce I dissolve about one pound of copperas in a gallon of water, and this solution I mix with the aluminous earth to about the consistence of a paste, and spread it out in thin layers, and treat it in the manner as described above when metallic iron is used; at the same time I cause a free acid to be present. Sulphuric or muriatic acid I find the most adapted for practical purposes, particularly the latter. Instead of sulphuric acid I propose to use humic acid in combination with copperas; the solution of copperas may be used by itself, or in combination with hydrate or carbonate of lime, for the purpose of decomposing it faster. I mix with it either slacked lime, or better finely ground carbonate of lime, two pounds of the latter to one gallon of the above-described copperas solution, with which the aluminous earth is mixed. Chalk, finely ground, answers very well for supplying the carbonate of lime. During the process of the repetition of evaporation, free acids in diluted form, as mentioned above, are added to the mixture of aluminous earth, copperas solution, and lime; and here the addition of

humic acid has proved very effective, and has been found to produce very good and important results.

In the choice of the lime itself I have discovered that if finely ground coral or coralline oyster shells, or shells of a similar kind, either in their fresh state or even when they are found as fossil shells in mineral deposits, are used, the quantity of ammonia produced is very much increased, which effect is likewise produced by the fossiliferous limestone of the different geological formations, which are sometimes filled with animal or other remains or shells in a fossil state.

The explanation of this I consider to exist in assuming that by the action of the proto-sulphate of iron upon the shells or fossiliferous limestone, the particles of the latter are so fully decomposed and separated that any organic remains which they yet contain are set free, and may serve to increase the amount of ammonia being produced. I would here observe that ammonia produced by any of the well-known methods, either from organic remains or otherwise, may be absorbed, condensed, and fixed in the manner above described by means of aluminous earths and salts or acids.

The salts of ammonia made thus by the above-described processes may now be washed out from the aluminous earth in which they are contained, or if they are used for agricultural purposes (for which this process is intended) the aluminous earth itself is to be used as a fertilizer.

I claim, first, the generation or manufacture of ammonia from its elements obtained from the air and the decomposition of water. I also claim the use of highly oxidizable metals or salts for this purpose, as above explained.

Secondly, I claim the use and application of gypsum or aluminous earths, as above set forth, for condensing and absorbing ammonia, and also the use of acids or salts in combination with the aluminous earths for fixing the ammonia.

Thirdly, I claim the use and application for the purposes herein set forth of shells, corals, fossiliferous limestone, and fossil animal remains.—In witness, &c.

CHARLES FREDERICK SPIEKER.

Specification of the Patent granted to WILLIAM CHISHOLM, *of Holloway, in the County of Middlesex, Chemist, for Improvements in the Purification of Coal Gas for the Purposes of Illuminating and Heating, and Obtaining, by the Ingredients used therefor, Manures, Salts of Ammonia, and Sulphur.*—Dated May 21, 1853.

To all to whom these presents shall come, &c., &c.—My invention consists,

First, in the purification of coal gas by peats containing substances with which they are found associated in nature, or peats to which, when deficient in such substances, they are artificially supplied.

Secondly, in the obtaining salts of ammonia from peats which have been so used for the purification of gas, and from the ordinary ammoniacal liquor of gas-works by the use of similar peats.

Thirdly, in the production of a manure by mixing certain substances with some of the peats so used for the purification of gas.

Fourthly, in the obtaining of sulphur as a residuum in a certain part of the process.

There are to be found in various localities in the United Kingdom peats naturally combined with mineral substances capable of purifying illuminating gas; I avail myself of the use of such peats in my operation. I use, for instance, a peat containing a peroxide of iron for depriving gas of its sulphuretted hydrogen, and another peat containing a sulphate of iron, or a sulphate of lime, for depriving gas of its ammonia. Where a peroxide of iron peat is not easily obtained I treat a sulphate of iron peat in a manner hereafter to be described, so as to bring the iron to the state of peroxide.

It is desirable to have the peat saturated with as large a proportion of the mineral substances as will not entail the necessity of too frequently opening the purifying vessels, but not so much as to cause much resistance to the free passage of the gas through it, thereby causing a back pressure upon the retort; about forty per cent., by weight, may be considered the maximum, but poor mineral peats may be brought up to any given standard by a process I will hereafter describe. The dry lime purifiers are vessels

too well known at all gas-works to require any description; such vessels I make use of in my operations, and they should never be fewer than four in number, although three only are required to be in operation at one time; let us suppose there are four, and numbered 1, 2, 3, and 4. I fill No. 1, with sulphate of iron peat, No. 2, with peroxide of iron peat, and No 3, is charged in the usual way with a hydrate of lime; this latter vessel is connected with the gasometer and gas-holder; the gas is made first to pass through No. 1, where the ammonia will be arrested by the sulphuric acid contained in the sulphate of iron, forming a sulphate of ammonia; it then passes through No. 2, where its sulphuretted hydrogen is decomposed by the peroxide of iron, sulphur being deposited in its progress. In No. 3, the carbonic acid is fixed by the hydrate of lime, forming a carbonate of lime; the gas now passes on to the gas-holder; the time that the material will continue to purify gas will depend upon a variety of circumstances, such as the quality of the coal, the size of the purifying vessels, and the quantity of gas passed through them; the vessels may be such a size as not to require charging for several months; the application of a test will at once show when the material ceases to purify gas; for instance, if the gas which has passed through No. 1, stains turmeric paper brown, it shows that ammonia is escaping, and the vessel must be emptied and recharged; if paper moistened with a solution of acetate of lead is stained black upon being exposed to the gas after it has passed through No. 2, it proves that sulphuretted hydrogen is present; the contents should be removed and freshly charged, or the contents of the vessel may remain, provided they have been exposed to the air, or a stream of atmospheric air has been passed through; if moistened with steam, the reconversion of the protosulphuret into a peroxide of iron will be promoted. I have, however, found in practice, that it is better to remove the material, and use a fresh charge. If the gas from No. 3, turns lime water milky, it indicates the presence of carbonic acid; the carbonate of lime should in this case be removed, and the vessel charged with a fresh supply of hydrate of lime. In a gas-works in full operation the gas continues to flow from the retorts through the purifiers to the gas-holder without interruption, night and day; there can, therefore, be no shutting off the gas while you are emptying and replenishing the contents of a purifying

vessel; hence the necessity of No. 4, a spare vessel; we shall suppose that No. 1, is the first vessel which shows symptoms of being saturated by turning brown the turmeric paper. Immediately charge No. 4 with a sulphate of iron peat, and turn the gas from No. 1 to No. 4; the vessels change places, the gas passing first through No. 4, then on to No. 2, then to No. 3, and, lastly, into the gas-holder; the contents of No. 1 are removed, and the sulphate of ammonia washed out; the peat is then spread upon the floor of a building which has a roof to protect it from the rain, but open in other respects to the atmosphere; here it requires to be turned over frequently, so that the superabundant moisture may evaporate, and the iron become peroxidized. We will now suppose that No. 2 requires to be changed, the gas having begun to blacken the acetate of lead paper. We refill No. 1 either with a fresh peroxide peat, or with the peat that was originally contained in No. 1, from which the sulphate of ammonia has been washed out, and which has been peroxidized and dried by exposure to the atmosphere; the gas is then shut off from No. 2, and turned on No. 1, and passes through, first No. 4, then No. 1, and, lastly, No. 3. The same process of changing vessels takes place when No. 3 becomes foul, that is, when it ceases to take up carbonic acid; by having four purifying vessels there will always be an empty one ready to substitute for that which requires changing; the sulphate of ammonia which has been washed out is evaporated and treated in the usual way. There will always be plenty of peroxide of iron peat after the first operation upon the gas, resulting from the peat that has taken up the ammonia, for when the ammonia has been washed out of it, and it has been exposed to the atmosphere, it becomes a peroxide peat; when you first commence, however, to purify gas, and have not a peroxide peat, you must substitute a sulphate of iron peat which has been mixed with such a proportion of hydrate of lime as will decompose the sulphate of iron, forming a peroxide of iron and a sulphate of lime. The quantity of lime required to do this will of course depend upon the proportion of sulphate of iron contained in the peat; say, there is twenty-eight per cent. of sulphate of iron present, you will then require for every 100 lbs. of such peat 12 lbs. of hydrate of lime. The presence of the sulphate of lime in the peroxide peat is rather disadvantageous; that peat, therefore, from which the ammonia has been washed out, should always be

used after the first operation. The peroxide of iron peat may be used over and over again to deprive gas of its sulphuretted hydrogen in the manner I have already described; it may be used a dozen times or more until the sulphur deposited impairs the free flow of the gas; from the peat so charged with sulphur may be readily obtained by sublimation. Sulphate of lime peat, that is, peat more or less saturated with sulphate of lime, is to be found in many localities; it may be economical, therefore, to use such peat at many gas works to deprive gas of its ammonia; where it is used it is better to make it the second vessel through which the gas passes: the reason of this will be obvious to every chemist, for the various impurities contained in the gas coming in contact with the sulphate of lime would cause a variety of decompositions, which would render the process of obtaining the commercial salts of ammonia very troublesome; all this will be avoided by first passing the gas through the peroxide-peat, so as to deprive it of its sulphuretted hydrogen; it then passes through the sulphate of lime, where the sulphuric acid contained in the lime seizes upon the ammonia, forming sulphate of ammonia, the lime at the same time taking up the carbonic acid.

I have stated that peat containing forty per cent. of a peroxide or sulphate of iron may be considered the maximum for working beneficially, as the gas is apt to cause a back pressure upon the retorts when the substance is more dense; where peat is found richer than this it will be desirable to mix it with a lighter peat, or peat charcoal, so as to bring it down to about forty per cent.; and in other cases, where the peat does not contain a sufficient quantity of the peroxide or sulphate of iron, the requisite per-centage may be obtained by mixing the richer or more dense with the poorer peats, or by burning some peat and mixing the ashes with other peat in sufficient quantity to obtain the desired strength, or by causing the natural solution of iron as it escapes out of the rock or soil to flow amongst a quantity of peat that has been previously dried, removing it when saturated, and drying it again, repeating the operation from time to time until the desired strength of iron is obtained. I mix chloride of sodium (common salt) with peat or peat charcoal to charge the purifier for depriving gas of its ammonia; the peat may be of the kinds I have described, containing iron or lime, or it may be the common rich vegetable peat; the quantity of salt had better not exceed twenty

per cent., and it will mix much better with the peat if it is first made into a saturated solution with water. There will be left in the peat muriate of ammonia, which may be washed out and treated in the usual manner. I produce a manure by combining certain substances with the residual matters left by the gas after it has passed through the ammonia purifier. I make use of the following composition, the proportions, however, may be varied:—Superphosphate of lime, twenty-four parts, by weight; bisulphate of potassa, sixteen; chloride of sodium, seven; sulphate of magnesia, eight; peat, forty-five; the whole to be well mixed, and incorporated together by any mechanical means, and placed in the ammonia purifier, which I have above called vessel No. 1. I have described the peats combined with iron, because I have in every instance found them the most efficient for the purification of gas. I have found in peat bogs, however, peats containing oxides or sulphates of manganese and copper; these or either of them may be used profitably for purifying gas, and treated in a similar manner to that above described for iron peats. The ordinary ammoniacal liquor of gas works I treat in the following manner, so as to deprive it of its sulphuretted hydrogen, and convert the sulphide of ammonium into a sulphate of ammonia: there should be three filters, and we call them A, B, and C. A and B are placed side by side; C, is placed higher, so that its front edge rests upon the back edges of A and B, like steps of a staircase: all filters should be divided crossways, by partitions, three or four will be a convenient number; they should be moveable for the convenience of emptying, and about two feet apart will be found a desirable space; the first partition is flush with the top of the filter, but does not reach within two inches of the bottom; the second partition goes home at the bottom, but does not reach the top by two inches; the third, again, is flush with the top, but does not reach within two inches of the bottom, and so on alternately according to the number of partitions; from the last division of C, there is an exit pipe, having two branches, with a stop cock attached to each; one of these branches opens into the first division of A, the other in a similar manner into B. C, is filled with a peroxide of iron peat, or that which has been removed from the purifier, and from which the sulphate of ammonia has been washed out. A and B, are filled with a sulphate of lime or a sulphate of iron peat, a perforated piece of wood or iron is placed upon the peat in the first

division of each of the filters, so as to distribute the liquid, when pumped up over the surface of the peat beneath, in the last divisions of A and B; there are also exit pipes, from which the solution of sulphate of ammonia may be received into any convenient vessel for the purpose of evaporating down, so as to produce a commercial sulphate of ammonia. We shall suppose the filters are charged and ready for operation, the stop-cocks being closed. We first open the stop-cock of the branch pipe from C, and which enters the first division of A. We then pump up the foul ammoniacal liquor into the first division of C, the liquid being received upon the perforated metal or wood; the fluid descends the first division, ascends the second, again descends the third, and so on alternately, until it reaches the exit pipe, which conducts it into the first division of A. The same chemical action takes place upon the foul ammoniacal liquor in its passage through filter C, as takes place upon the gas in its passage through No. 2, purifying vessel; that is, it decomposes its sulphuretted hydrogen; it also arrests tar and other impurities that have been held in suspension. A clear liquid will now flow into A, holding in solution a carbonate of ammonia and caustic ammonia, and will pass through the filter by descending and ascending, as described with C; in its passage the sulphuric acid of the lime or of the iron will seize upon the ammonia, and convert it into a sulphate; the pure solution of sulphate of ammonia will pass away by the exit pipe at the last division; when all the sulphuric acid contained in A, has been combined with ammonia, A should be shut off from C, by turning the stop-cock, that which communicates between B and C should be opened: it will at once be ascertained when this is necessary by exposing a piece of turmeric paper to the fluid at the exit pipe of A; as soon as the turmeric changes to a brown colour, stop at once; steam or water should now be passed through A, to wash out all the sulphate of ammonia; when the liquid from the exit pipe is mixed with a little caustic lime, and does not smell of ammonia, it is sufficiently washed. The contents may now be removed from A, and, for the convenience of the workmen, the partitions may be withdrawn; it is then charged with fresh sulphate peat, to be ready when B has ceased to take up ammonia. If it is a sulphate of iron peat that has been used, it may be spread out exposed to the atmosphere, and used for charging C filter, or No. 2, gas purifying vessel; of course, the same

process takes place in filter B, that took place in A; filter C will last a long time. To know when it should be fresh charged, hold a piece of white paper, moistened with a solution of acetate of lead, to the fluid as it flows into A or B; if the paper is stained black it is time to change.

Having now described the nature of my invention, and the manner in which the same is to be performed, I would here observe, that I do not confine myself to the precise details herein set forth, or in the proportions given, as they may be varied according to the nature, quality, or weight, or other varying properties of the articles used, so as to suit or give effect to the processes I have described; nor do I lay any claim to any of the substances, fluids, or other matters or things herein mentioned, taken separately, and not in combination, for the purposes of my invention. In witness, &c.

WILLIAM CHISHOLM.

Specification of the Patent granted to WILLIAM MANN, *of Stepney, in the County of Middlesex, Gas Engineer, for Improvements in the Purification of Gas, and in the Treatment of the Material used in such Purification.*—Dated August 23, 1853.

To all to whom these presents shall come, &c., &c.—The first of my improvements consists in making ammonia to combine with a certain portion of the water with which the lime is slaked to prepare it for what is called dry lime purifying.

The mode I adopt for the above purpose is to cause common atmospheric air, warm or otherwise, or any other suitable vehicle, to pass through a vessel or vessels in which ammonia is generated or exhaled, and from thence to the purifier, which has just received a fresh charge of lime, the water in which will take up the ammonia, and the air, now free from the ammonia with which it was loaded on entering the purifier, may be allowed to escape into the atmosphere; or I pass the air or other fluid through a vessel or vessels in which coal gas has been wholly or partly condensed for the purpose of bearing ammonia to the water, which is mixed with the lime in the purifier.

When the water will take up no more of the ammonia

contained in the air, which may be ascertained by any of the known tests for ammonia, the purifier is ready for purifying purposes, and the vessel or vessels through which the air was passed may be used for condensing purposes; the number of such vessels would be regulated by the number of sets of purifiers.

When gas containing sulphuretted hydrogen and carbonic acid is passed through a vessel or vessels containing hydrate of lime and liquid ammonia the carbonic acid will be converted into carbonate of ammonia, and the lime having only the sulphuretted hydrogen to take out will purify a much larger quantity of gas than usual. If the gas, after passing the purifiers, be passed through a water scrubber, all the ammonia compounds will be removed.

When the lime has become foul, to prevent any noxious vapours escaping into the atmosphere I cause carbonic acid, or carbonic acid and common air in about equal proportions, or, what is better, the products of combustion of carbon, such as coke or charcoal, to pass through the foul lime, either in or out of the purifiers; but to bring off that quantity of sulphuretted hydrogen which would escape if the lime was exposed to the air in the usual way, and to prevent the sulphuretted hydrogen escaping into the chimney, where the products of combustion or other gases which may be used to deodorise or ventilate the foul lime are returned, I cause the deodorising or ventilating medium to pass through any of the materials known to take up sulphuretted hydrogen, and which will not give it off again when exposed to the air.

The deodorising or ventilating medium will also bring the ammonia that is left in the purifiers away with it, which can be taken out by a small scrubber, so that the products of combustion or other gases used to deodorise or ventilate the foul lime will take no impurities to the atmosphere, and the lime when taken from the purifiers will be free from noxious vapours.

All danger of explosion is avoided in consequence of the small quantity of oxygen present in the deodorising or ventilating medium, even when atmospheric air is in part used.

If the products of combustion, or atmospheric air and carbonic acid, or atmospheric air and the products of combustion of carbon, be used to deodorise or ventilate the foul lime, and the oxide of iron (or any other material known to

take up sulphuretted hydrogen) be used to take up the sulphuretted hydrogen, the vessel will not require opening often, as there will be oxygen present, and which will, to a certain extent, restore or revivify it.

As my improvements do not extend to any apparatus or machinery used in the above process, it will be understood that wherever any mention is made of vessels it refers to those generally used or employed in the manufacture and purification of gas.

Having now, to the best of my ability, described and ascertained the nature of this, my said invention, I claim,—

Firstly, the purifying of gas for the purposes of illumination and heat from carbonic acid by ammonia in combination with the water which is mixed with the lime to prepare it for dry lime purifying.

Secondly, the means of ventilating or deodorising the foul lime, as herein described, so that no noxious vapours can escape into the atmosphere.

Thirdly, the using a deodorising or ventilating medium which cannot form an explosive mixture with coal gas.

WILLIAM MANN.

EXTRACT FROM THE REPORT OF THE COMMISSIONER OF PATENTS OF THE UNITED STATES OF AMERICA.*

ANOTHER change connected with this subject which seems to be imperatively called for, relates to the fee required of foreigners. That fee seems to the undersigned enormous and indefensible upon any principle of justice or sound policy. If a patent is to be regarded as a downright gratuity conferred by the Government on the inventor, simple equity dictates that we should not impose more onerous conditions on the subjects of other governments than those governments exact from our own citizens. The stern rule of retaliation would ask for nothing more than such reciprocity.

Within the last two years Great Britain has greatly diminished her former high rates of patent fees. It is believed that in no country in Europe are our citizens taxed for these purposes as severely as we now tax theirs. It

* From the American "Polytechnic Journal."

is well known that some European governments impose a lower rate of fees on an American citizen than he would be required to pay by this office; and yet we continue to charge a British subject 500 dollars, and any other aliens 300 dollars, for that which we grant to our own citizens for 30 dollars.

But the granting of a patent is not a mere gratuity by the Government: it is the recognition of an evident right in the inventor. No title to property can be more just or valid than his who has created that property. The rule of natural justice is the same in this respect whether the inventor be a citizen or an alien. It is right that the Government should charge the patentee with the expense of securing him in his title to what was before rightfully his own; but it is questionable whether a revenue should be sought from this source except in cases of great necessity. Is there any sufficient reason why the general rule should be departed from in the case of an alien?

It may seem reasonable that we should charge an alien the same fee that his Government would charge one of our own citizens under like circumstances; but it should be recollected that European governments make no discrimination between natives and foreigners. The high or low rates are the same for all. Under such circumstances retaliatory measures are not resorted to by us in regard to any other subject.

The oppression to which an alien is subjected at home has never been held as a reason for oppressing him here, even prior to his taking steps to become a citizen. If he holds real estate, we do not levy extraordinary taxes thereon commensurate with what that same property would be taxed if owned in his country by one of our citizens. Why should a different rule be followed in regard to property in an invention?

But there is a reason, founded in sound policy, why greater liberality should be exercised towards a foreign inventor than towards the alien owner of tangible property. He pays a consideration, which the other does not: by taking out a patent, he makes the subject thereof public property at the end of fourteen years. The benefits of the invention are then secure, and can never be lost to the world. High charges deter inventors from parting with their secrets. Many an invention is thus strangled in its birth, which, under other circumstances, might have been

developed into something of vast consequence to the world.

There are no lost arts under a liberal and well-regulated Patent-office system; and this is one of its great advantages. If foreign nations choose to place these chief means of human progress in subordination to the requirements of their respective exchequers, we are forbidden to imitate them, both by the condition of our treasury and the well-established policy of our government.

Finally, while we extend the free and full benefits of all our institutions to the alien who comes hither to seek them, should not a course equally liberal be pursued in regard to inventions,—the creations of his ingenuity? Why should these be subjected to incapacities and discriminating taxation? In regard to them should not the whole world be regarded as one republic, of which we should seek to render our Patent-office the capital, wherein every region should be permitted a free representation? We tolerate no onerous discriminations against the foreign exhibitors in our Crystal Palaces. At the cannon's mouth we extend the protection of our flag to the alien who has simply declared his purpose of becoming a citizen, in the same manner as though he were native born. Ought we to levy a discriminating tax upon the offspring of genius that seek our shores for the express purpose of being naturalized among us?

From the preceding considerations it seems evident that a great change should be made as to the fees required from foreign applicants. It is respectfully submitted, whether the most convenient, wise, and beneficial rule will not be to abolish all distinctions growing out of geographical considerations, and to charge every applicant a fair remuneration for the trouble given by him to the office, but no more.

Such a course would be just, generous, and noble; seeking to raise no revenue from those who are the special instruments of human advancement, showing a confidence in the capability of our own inventors to cope on equal terms with those of all the world besides, and taking no inconsiderable step in bringing about that great brotherhood of nations for which a higher civilization is gradually preparing the world.

(Signed) CHARLES MASON,
Commissioner.

To the Hon. D. R. Atchison.

PATENTS SEALED TO MAY 16, 1854.

2459. JOHN DRUMGOOLE BRADY, of Cambridge-terrace, Hyde Park, Middlesex, Esquire, for An appendage to knapsacks.—Dated October 25, 1853. Sealed April 25, 1854.

2465. WILLIAM BOTTOMLEY, of North Brierly, Bradford, York, Designer and Pattern Card Maker, for Improved machinery for hand and power-loom weaving, and especially applicable to weaving figured, fancy, and checked goods, with any number of picks by Jacquard engines.—Dated October 25, 1853. Sealed April 25, 1854.

2468. MARCUS DAVIS, of Cloudesley-square, Islington, Middlesex, for Improvements in the treatment of fibrous materials other than flax and hemp.—Dated October 25, 1853. Sealed April 25, 1854.—(A communication.)

2470. GEORGE GOWER WOODWARD, of Lesswels, near Kidderminster, for Improvements in the manufacture of carpets.—Dated October 25, 1853. Sealed April 25, 1854.

2481. JAMES THOMAS GEORGE VIZETELLY, of Peterborough-court, London, Engraver and Printer, for Improvements in producing plates for printing purposes, by which the manipulatory process of engraving is superseded.—Dated October 26, 1853. Sealed April 25, 1854.—(Partly communicated.)

2482. AMEDEE FRANÇOIS REMOND, of Birmingham, Gentleman, for Improvements in the manufacture of certain kinds of metallic vessels.—Dated October 27, 1853. Sealed April 25, 1854.

2487. WILLIAM VAUGHAN, of Stockport, Gentleman, JOHN SCATTERGOOD, of Heaton Norris, Machinist, and CHARLES GRIMSHAW, of Birmingham, Chester, Manager, for Certain improvements in healds or harness for weaving, and in the method of and machinery or apparatus for fabricating the same.—Dated October 27, 1853. Sealed April 25, 1854.

2498. JOHN WALKER WILKINS, of Ludgate-hill, Electric Telegraph Engineer, for Improvements in obtaining power by electro-magnetism.—Dated October 28, 1853. Sealed April 25, 1854.

2660. JAMES BRISTOW, of Bouverie-street, London, Miller, and HENRY ATTWOOD, of Holland-street, Blackfriars-road, Surrey, Engineer, for An improved mode of constructing marine boilers.—Dated November 16, 1853. Sealed April 25, 1854.

2946. ROBERT WHEWELL, of Little Bolton, Bolton-le-Moors, Lancaster, Printer and Bookbinder, for Improvements in machines used for cutting paper.—Dated December 17, 1853. Sealed April 25, 1854.

28. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for Improved machinery for crushing or grinding, and washing and amalgamating quartz, rock, and other substances.—Dated January 5, 1854. Sealed April 25, 1854.—(A communication.)

180. WILLIAM MASSEY, of Hemer-terrace, Bootle-cum-Linacre, near Liverpool, Manufacturer of Mineral Teeth, for Improvements in artificial teeth and gums.—Dated January 24, 1854. Sealed April 25, 1854.

228. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Middlesex,

Gentleman, for Improvements in the manufacture or production of gas, and in the application of the materials employed therein.—Dated January 30, 1854. Sealed April 25, 1854.—(A communication.)

234. LUTHER YOUNG, of Bow-lane, Cheapside, and EDWIN MARTEN, of Louisa-street, Stepney, for Improvements in apparatus for regulating the pressure and supply of gas.—Dated January 31, 1854. Sealed April 25, 1854.

262. HENRY WATSON, of Highbridge, Newcastle-on-Tyne, for Improvements in the working of brass and copper into forms, and planishing them.—Dated February 2, 1854. Sealed April 25, 1854.

274. EDWARD HOWARD and DAVID PORTER DAVIS, of Massachusetts, America, for Improvements in machinery for sewing cloth or other material.—Dated February 3, 1854. Sealed April 25, 1854.

388. MOSES POOLE, of Avenue-road, Regent's Park, Gentleman, for Improvements in boiler-furnaces, and other furnaces.—Dated February 17, 1854. Sealed April 25, 1854.—(A communication.)

416. ERNEST GESSNER, of Ane, near Schneeburg, Saxony, for Improvements in gig mills.—Dated February 21, 1854. Sealed April 25, 1854.

452. EDWARD HAMMOND BENTALL, of Heybridge, Essex, Ironfounder, for Improvements in ploughs or implements for cultivating land.—Dated February 25, 1854. Sealed April 25, 1854.

466. JOHN ELDER, of Glasgow, Engineer, for Improvements in marine steam-engines.—Dated February 25, 1854. Sealed April 25, 1854.

2495. MALCOLM MACLAREN, of Johnstone, Renfrew, Surgeon, for Improvements in fire-places, grates, or furnaces.—Dated October 28, 1853. Sealed April 28, 1854.

2503. RICHARD ARCHIBALD BROOMAN, of Fleet-street, London, for Improvements in machinery for dressing flax, hemp, and other like fibrous substances. Dated October 29, 1853. Sealed April 29, 1854. —(A communication.)

2507. JOHN TURNER WRIGHT, of Birmingham, Manufacturer, EDWIN PAYTON WRIGHT, of Birmingham aforesaid, Manufacturer, and WILLIAM ASBURY, of Birmingham aforesaid, Engineer, for An improvement or improvements in mill banding.—Dated October 31, 1853. Sealed April 28, 1854.

2509. EDWARD GREGSON BANNER, of Cranham Hall, Essex, Gentleman, for Improvements in obtaining and applying motive power.—Dated October 31, 1853. Sealed April 28, 1854.

2511. FELIX PAULIN ROVERE, of Wellington-street, Strand, Civil Engineer, for Improvements in joints for tubular drains.—Dated October 31, 1853. Sealed April 28, 1854.

2516. JOHN BROWN, of Darlington, Mining Engineer, for Improvements in the construction of wagons.—Dated October 31, 1853. Sealed April 28, 1854.

2517. DAMIANO ASSANTI, of Upper Berkeley-street, Middlesex, Gentleman, for A new or improved cooling and freezing mixture.—Dated October 31, 1853. Sealed April 28, 1854.

2522. SAMUEL LOMAS, of Manchester, Manager, for Improvements in machinery for spinning and doubling silk.—Dated November 1, 1853. Sealed April 28, 1854.

2536. EDWIN DALTON SMITH, of Hertford-street, Mayfair, Middle-

[illegible] A new buffer-break for railway carriages.—Dated Nov 2, 185[illegible] Sealed April 28, 1854.

2743. HENRY BARLEY, of Chorley, Lancaster, Manufacture Improvements in machinery or apparatus for spinning and dou [illegible] and other fibrous substances.—Dated November 2, 1853. S April 28, 1854.

2771. SAMUEL HARRISON, of Crewe, Chester, Engineer, fo provements in and applicable to steam-engines.—Dated Novem 185[illegible] Sealed April 28, 1854.

2773. CHARLES CARR, of Seghill, Northumberland, Mining and WILLIAM KYLE HORSLEY, of the same place, Engine Improvements in steam-machinery and pumps for lifting water mines and other places.—Dated November 5, 1853. Sealed Apr 1854.

2778. JAMES BARLOW, of Bolton-le-Moors, Manufacturer, THOMAS SETTLE, of the same place, Manager, for Certain imp ments in power looms for weaving.—Dated November 5, 1853. S April 28, 1854.

2781. MARIE LOUIS JOSEPH CHRISTOPHE VINCENT FA of Paris, for A certain composition for the preservation of the de Dated November 7, 1853. Sealed April 28, 1854.

2793. GEORGE SHEPHERD, of King William-street, London, Engineer, for Certain improvements in the construction of rail —Dated November 8, 1853. Sealed April 28, 1854.

2804. SOLOMON ABRAHAM, and SAMUEL VICTOR ABRAHA Lisle-street, for Communicating information or directions to perso change of railway trains.—Dated November 17, 1853. Sealed 28, 1854.

2826. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Midd Gentleman, for Improvements in printing oil cloths and other fa —Dated December 6, 1853. Sealed April 28, 1854.—(A commu tion.)

2841. WILLIAM FREDERICK PLUMMER, of Southwark, Mech for Improved machinery for grinding or crushing animal, vege and mineral substances.—Dated December 13, 1853. Sealed 28, 1854.

2880. JAMES GIBBONS, of Wolverhampton, Lock Manufact for Improvements in locks and latches.—Dated December 22, Sealed April 28, 1854.

2882. GUSTAV ADOLPH BUCHHOLZ, of Gould-square, Lo Civil Engineer, for Improved machinery for the cleaning and h or dressing of rice, wheat, and other grain.—Dated Decembe 1853. Sealed April 28, 1854.

281. ROBERT STIRLING NEWALL, of Gateshead, Durham, Rope Manufacturer, for Improvements in setting up ships' riggi Dated February 4, 1854. Sealed April 28, 1854.

312. PETER ARMAND LECOMTE DE FONTAINEMOREAU, of S street, Finsbury, London, for Improvements in fire arms.—D February 9, 1854. Sealed April 28, 1854.—(A communication.)

328. HENRY WARNER, of Loughborough, Manufacturer, JOSEPH HAYWOOD and WILLIAM CROSS, of the same Mechanists, for Improvements in knitting machinery.—Dated ruary 10, 1854. Sealed April 28, 1854.

353. THOMAS BURY, WALTER GLOVER, JAMES WILLIAM Sh

and JOHN HARDMAN, all of Salford, for Improvements in machinery or apparatus for stretching, drying, and finishing yarn and woven fabrics composed of cotton, wool, silk, or other fibrous materials.—Dated February 14, 1854. Sealed April 28, 1854.

356. CHARLES AUGUSTUS HOLM, of Cecil-street, Strand, Civil Engineer, for Improvements in propelling.—Dated February 14, 1854. Sealed April 28, 1854.

365. BENJAMIN HORNBUCKLE HINE, and ANTHONY JOHN MUNDELLA, of Nottingham, Manufacturers, and WILLIAM ONION, also of Nottingham, Mechanic, for Improvements in machinery for the manufacture of textile and looped fabrics.—Dated February 15, 1854. Sealed April 28, 1854.

414. ROBERT WALKER, of Glasgow, Merchant, for Improvements in signalling by voltaic electricity for the purpose of increasing the safety of railways.—Dated February 21, 1854. Sealed April 28, 1854.

415. JAMES BOYDELL, of Gloucester-crescent, Regent's-park, for An improvement in the manufacture of hurdles and gates.—Dated February 21, 1854. Sealed April 28, 1854.

473. CHARLES DE BUSSY, of Mornington-road, Regent's-park, Mining Engineer, for Improvements in machinery or apparatus for the amalgamation of gold ores.—Dated February 27, 1854. Sealed April 28, 1854.

485. ANDRE LOUIS MALLETT, of Paris, for Improvements in apparatus to destroy the effects of shocks.—Dated February 28, 1854. Sealed April 28, 1854.

496. CHARLES HARGROVE, of Birmingham, Manufacturer, for An improvement or improvements in steam-boiler and other furnaces.—Dated March 1, 1854. Sealed April 28, 1854.

534. JOHN WARHURST, of Hollingsworth, Chester, Cotton-dealer, for Improvements in steam-boilers.—Dated March 6, 1854. Sealed April 28, 1854.

2464. DAVID BOGUE, of Fleet-street, Publisher, for An improved mode of producing printing surfaces. — Dated October 25, 1853. Sealed April 29, 1854.—(A communication.)

2524. MARK NEWTON, of Tottenham, Builder, for Certain improvements in the construction of carriages, and in the means of preventing the overturning the same when the horses take fright.—Dated November 1, 1853. Sealed May 1, 1854.—(A communication.)

2525. ARTHUR ELLIOTT, of West Houghton, Lancaster, Mechanic, for Improvements in looms for weaving.—Dated November 1, 1853. Sealed May 1, 1854.

2555. GEORGE DUNCAN and JOHN BOYD, both of Liverpool, Patent Cask Manufacturers, and JOHN BARKER, of Knotty Ash, near Liverpool, M.D., for Improvements in casks, and in machinery or apparatus for the manufacture of casks.—Dated November 3, 1853. Sealed May 2, 1854.

2559. GEORGE NASMYTH, of Brabant-court, Philpot-lane, London, for Improvements in the construction of steam-boiler and other furnaces.—Dated November 4, 1853. Sealed May 2, 1854.

2562. WILLIAM CROSLAND, of Hulme, Lancaster, Engineer, for Improvements in apparatus for governing the speed of steam and other motive-power engines.—Dated November 4, 1853. Sealed May 2, 1854.

2688. JAMES HARRIS, of Hanwell, Engineer, for Improvements in apparatus for heating water and other fluids.—Dated November 19, 1853. Sealed May 2, 1854.

2707. EDWARD BRIGGS, of the Castleton-mills, near Rochdale, Manufacturer, for Improvements in weaving and manufacturing raised pile fabrics, and in machinery employed therein.—Dated November 22, 1853. Sealed May 2, 1854.

2899. JOHN ZUILL KAY, of Dundee, Gas Engineer, for Improvements in gas-meters.—Dated December 14, 1853. Sealed May 2, 1854.

2909. JACQUES PIERRE HENRI VIVIEN, Manufacturer, of Paris, for Certain improvements in the manufacture of paper and paste-board.—Dated December 15, 1853. Sealed May 2, 1854.

2951. AUGUSTE EDOUARD LORADOUX BELLFORD, of Holborn, London, for Certain improvements in presses for expressing oil or other fluids from fruits, grains, or other substances.—Dated December 19, 1853. Sealed May 2, 1854.—(A communication.)

41. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Gentleman, for Improvements in machinery or apparatus for effecting agricultural operations, and in communicating power thereto, parts of the said improvements being applicable to the obtainment of motive power for general purposes.—Dated January 7, 1854. Sealed May 2, 1854.—(A communication.)

78. JOHN FULLER BOAKE, of Dublin, Lampist to the Great Southern and Western Railway of Ireland, for Improvements in and applicable to certain lamps or lanterns, so that either candles or oil may be used therein with facility.—Dated January 12, 1854. Sealed May 2, 1854.

196. CHARLES REEVES, of Birmingham, Manufacturer, and WILLIAM WELLS, of Sutton Coldfield, near Birmingham, Carpenter, for An improvement or improvements in casting metals.—Dated January 26, 1854. Sealed May 2, 1854.

502. WILLIAM and JOSEPH CLIBRAN, of Manchester, Machinists, for Certain improvements in apparatus for regulating or governing the supply or pressure of gas as it is conducted from the main to the burners.—Dated March 1, 1854. Sealed May 2, 1854.

2554. PETER KINDLE, of Ramsbottom, Manufacturer, for Improvements in power-looms for weaving. — Dated November 3, 1853. Sealed May 3, 1854.

2556. EBENEZER GODDARD, of Ipswich, Gas Engineer, for Improvements in gas-burners.—Dated November 3, 1853. Sealed May 3, 1854.

2566. HENRY PRATT, of Boughton-street, Worcester, for Improvements in kneading dough, and which said improvements are also applicable to the kneading or beating of clay, loam, or other plastic materials.—Dated November 4, 1853. Sealed May 3, 1854.

2569. JOHN SMITH, of Albion Works, Bradford, Machine-maker, for Improvements in millstones for grinding corn, seeds, or minerals.—Dated November 5, 1853. Sealed May 5, 1854.

2572. JOHN HYDE, of Sheffield, for Improvements in furniture castors.—Dated November 5, 1853. Sealed May 5, 1854.

2574. ROBERT WILLIAM JEARRAD, of Upper Eccleston-place, Eccleston-square, for Improvements in steam-boiler and other furnaces.—Dated November 5, 1853. Sealed May 5, 1854.

2577. WILLIAM BECKETT JOHNSON, of Manchester, for Improvements in steam-engines, and in apparatus for indicating the pressure of steam.—Dated November 5, 1853. Sealed May 5, 1854.

2583. JONATHAN GRINDROD, of Liverpool, Consulting Engineer, and ALEXANDER HUNTER, of the same place, Engineer, for Improvements in steam-engines.—Dated November 7, 1853. Sealed May 5, 1854.

2584. HENRY WIGLESWORTH, of Newbury, Bachelor of Medicine, for Improvements in connecting together, or coupling railway carriages. —Dated November 7, 1853. Sealed May 5, 1854.

2585. ROBERT ROUGHTON, of Woolwich, Engineer in the Royal Navy, for An improvement in steam-boilers, which is applicable to other vessels for containing compressed air, vapour, or gas.—Dated November 7, 1853. Sealed May 5, 1854.

2586. THOMAS WALKER, of Birmingham, Engineer, for Improvements in signal apparatus for the prevention of accidents on railways. —Dated November 7, 1853. Sealed May 5, 1854.

2594. JOHN HENRY JOHNSON, of Lincoln's Inn-fields, Gentleman, for Improvements in machinery for combing and preparing wool and other fibrous materials.—Dated November 8, 1853. Sealed May 5, 1854.—(A communication.)

2676. THOMAS HOLMES, of Pendleton, Lancaster, Bleacher, for Improvements in ventilating drying stoves.—Dated November 18, 1853. Sealed May 5, 1854.

2689. AUGUSTE CASTETS, Civil Engineer, of Paris, for An improved composition for curing diseases in the feet of animals.—Dated November 19, 1853. Sealed May 5, 1854.

2754. EMMANUEL BARTHELEMY, and TONY PETITJEAN, of Upper John-street, Fitzroy-square, Mechanists, and JEAN PIERRE BOURGUIN, of Newman-street, Oxford-street, Merchant, for Improved means of ornamenting glass.—Dated November 25, 1853. Sealed May 5, 1854.

2768. PRIX CHARLES JEAN BAPTISTE SOCHET, of Paris, Gentleman, for Improvements in obtaining motive power by means of heated gases.—Dated November 25, 1853. Sealed May 5, 1854.

2802. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, for Improvements in blocks for ships and other uses.—Dated December 2, 1853. Sealed May 5, 1854.—(A communication.)

2910. AUGUSTE EDOUARD LORADOUX BELLFORD, of Castle-street, Holborn, for An improvement in blasting powder for mining and other operations of a similar nature.—Dated December 15, 1853. Sealed May 5, 1854.—(A communication.)

2942. JOHN GREENWOOD, of Arthur-street West, London Bridge, for Improvements in preventing drafts of air into rooms and places when the doors and windows are shut.—Dated December 17, 1853. Sealed May 5, 1854.

3010. FRANCIS PARKER, of Northampton, for An improvement in the manufacture of gaiters.—Dated December 28, 1853. Sealed May 5, 1854.

232. EDWARD WILLIAM KEMBLE TURNER, of Praed-street, Paddington, for Treating gold and other ores.—Dated January 31, 1854. Sealed May 5, 1854.

317. FARNHAM MAXWELL LYTE, of Florian, Torquay, for Improvements in apparatus for ascertaining the depth of water.—Dated February 9, 1854. Sealed May 5, 1854.

375. JOHN DAVIE MORRIES STIRLING, of the Larches, Camphill, near Birmingham, for Improvements in the manufacture of steel.— Dated February 16, 1854. Sealed May 5, 1854.

402. JAMES BEALL, of Effingham-place, Cheshunt, Herts, for Improvements in apparatus for suspending looking glasses in frames.—Dated February 20, 1854. Sealed May 5, 1854.

430. JAMES DE WOLFE SPURR, of Kenyon-terrace, Birkenhead, for Improvements in distilling coals and bituminous and resinous substances and products thereof.—Dated February 22, 1854. Sealed May 5, 1854.

472. JOHN DAVIE MORRIES STIRLING, of the Larches, near Birmingham, for Improvements in the manufacture of tubes and cylinders of steel.—Dated February 27, 1854. Sealed May 5, 1854.

487. JAMES MEDWIN, of the Blackfriars-road, Surrey, Engineer, for An improvement in water gauges for steam boilers.—Dated February 28, 1854. Sealed May 5, 1854.

506. THOMAS METCALFE, of High-street, Camden-town, Middlesex, for Improvements in the manufacture of portable and folding bedsteads, chairs, seats, tables, and cots.—Dated March 1, 1854. Sealed May 5, 1854.

522. CALEB BLOOMER, of West Bromwich, Stafford, Manufacturer, for Improvements in spikes and bolts.—Dated March 3, 1854. Sealed May 5, 1854.

544. WILLIAM CLAY, of Liverpool, Iron Master, for An improved mode of manufacturing axles, shafting, and other like solid articles which present a round figure in cross section.—Dated March 7, 1854. Sealed May 5, 1854.

548. HENRY BERNOULLI BARLOW, of Manchester, for Improvements in waterproofing and finishing textile fabrics and yarns.—Dated March 8, 1854. Sealed May 5, 1854.—(A communication.)

2598. JEROME ANDRE DRIEU, of Patricroft, Lancaster, Machinist, for Improvements in machinery for cutting velveteens and certain other fabrics to produce a piled surface.—Dated November 9, 1853. Sealed May 9, 1854.

2610. EDWARD GREGSON BANNER, of Cranham Hall, Essex, Gentleman, for Improvements in saddlery and harness.—Dated November 11, 1853. Sealed May 9, 1854.

2614. WILLIAM STEEL, of Glasgow, Brewer, for Improvements in machinery or apparatus for mashing malt.—Dated November 11, 1853. Sealed May 9, 1854.

2619. JAMES HILL DICKSON, of Evelyn-street, Deptford, Flax Manufacturer and Flax Machinist, for Improvements in the process of preparing flax or similar fibrous material, and rendering it fit for spinning and weaving.—Dated November 11, 1853. Sealed May 9, 1854.

2623. FRANÇOIS AMAND DELANDE, of Paris, Gentleman, for A new metallic composition.—Dated November 12, 1853. Sealed May 9, 1854.

2655. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Gentleman, for Improvements in thrashing machines, and in apparatus connected therewith.—Dated November 16, 1853. Sealed May 9, 1854.—(A communication.)

2663. GEORGE DUGMORE, of Birmingham, Manufacturer, and GEORGE HAYWOOD MILLWARD, of Birmingham, Manufacturer, for A new or improved method of signalling or communicating between trains and railways.—Dated November 17, 1853. Sealed May 9, 1854.

2698. WALTER HENRY TUCKER and WILLIAM RASHLEIGH REEVES, both of Tiverton, for Improvements in locks.—Dated November 21, 1853. Sealed May 9, 1854.

2767. JOHN WALMSLEY, of Accrington, Manufacturer, and JOHN INGHAM, of Blackburn, Mechanic, for Improvements in looms.—Dated November 28, 1853. Sealed May 9, 1854.

2955. JAMES HUNTER CAMPBELL, of King's Arms-yard, Coleman-street, City, Esquire, for Improvements in machinery for cutting corks.—Dated December 21, 1853. Sealed May 9, 1854.

303. ALFRED VINCENT NEWTON, of Chancery-lane, Middlesex, Mechanical Draughtsman, for Improvements in bleaching textile fabrics.—Dated February 7, 1854. Sealed May 9, 1854.—(A communication.)

357. THOMAS IRVING, of Mould Green, near Huddersfield, for Improvements in obtaining a metallic and lustry appearance to fabrics and yarns.—Dated February 14, 1854. Sealed May 9, 1854.

595. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Gentleman, for Improvements in lighting.—Dated March 11, 1854. Sealed May 9, 1854.—(A communication.)

621. JOHN HOUSTON, of Glasgow, Mill Manager, for Improvements in working steam-boilers, and in apparatus connected therewith.—Dated March 15, 1854. Sealed May 9, 1854.

634. JAMES GARTH MARSHALL, of Leeds, Flax Spinner, and PETER FAIRBAIRN, of same place, Machinist, for Improvements in machinery for combing flax, tow, wool, hair, and other vegetable or animal fibres.—Dated March 16, 1854. Sealed May 9, 1854.

2627. WILLIAM AUSTIN, of Holywell-street, Westminster, for Improvements in the manufacture of casks.—Dated November 12, 1853. Sealed May 12, 1854.

2629. WILLIAM AUSTIN, of Holywell-street, Westminster, for Improvements in apparatus for trapping passages into sewers or drains.—Dated November 12, 1853. Sealed May 12, 1854.

2634. HENRY WILLIS, of Manchester-street, Middlesex, Organ builder, for Improvements in the construction of organs and free-reed instruments.—Dated November 14, 1853. Sealed May 12, 1854.

2642. JOHN JOSIAS CATTERSON, of Islington, Middlesex, Civil Engineer, for Improvements in carriage springs.—Dated November 15, 1853. Sealed May 12, 1854.

2882. EDWARD GREEN, of Wakefield, York, Engineer, for Improvements in boilers and furnaces.—Dated December 10, 1853. Sealed May 12, 1854.

233. THOMAS HOLLINGSWORTH, of Nottingham, for Improvements in forming or applying tags to laces.—Dated February 1, 1854. Sealed May 12, 1854.

279. JAMES BOYDELL, of Anchor Iron Works, Smethwick, for An improvement in the beds of reverberatory furnaces used for puddling iron.—Dated February 4, 1854. Sealed May 12, 1854.

483. WILLIAM SIMPSON, of Fovil Upper Mills, near Maidstone, for An improvement in employing the manufacture of soap, a product obtained when manufacturing pulp from straw.—Dated February 28, 1854. Sealed May 12, 1854.

529. FELIX ABATE, of George-street, Hampstead-road, Architect and Civil Engineer, for Improvements in printing on and ornamenting surfaces.—Dated March 4, 1854. Sealed May 12, 1854.

563. GEORGE THOMAS SELBY, of Smethwick, Gentleman, for Improvements in machinery for the manufacture of tubes and pipes, and for shaping tubular and circular metal articles.—Dated March 9, 1854. Sealed May 12, 1854.

585. GEORGE APPOLT, of Sulzbach, Prussia, and CHARLES APPOLT, of Metz, France, for Improvements in the manufacture of coke.—Dated March 10, 1854. Sealed May 12, 1854.

2656. DAVID PRATT, of Birmingham, for Certain mechanical arrangements for raising thimbles, the same to be worked by steam, water, or other power, thereby superseding hand labour.—Dated November 16, 1853. Sealed May 16, 1854.

2657. JOHN FERGUSSON, of Heathfield, Brick and Pottery Manufacturer, for Improvements in furnaces and fire-places, and in the prevention of smoke.—Dated November 16, 1853. Sealed May 16, 1854.

2661. GEORGE CARTER, of Nottingham, Kent, Gentleman, for Improvements in the construction of steam-engine, boiler, and other furnaces.—Dated November 17, 1853. Sealed May 16, 1854.

2666. JOHN BANFIELD, of Birmingham, for A double-acting railway signal for preventing collisions or accidents on railways.—Dated November 17, 1853. Sealed May 16, 1854.

2669. THOMAS BOURNE, of West Smithfield, Saddler, for Improvements in the construction of buckles.—Dated November 17, 1853. Sealed May 16, 1854.

2681. JEAN BAPTISTE CLAVIERES, of Paris, Engineer, for An improved mode of giving publicity.—Dated November 18, 1853. Sealed May 16, 1854.

2691. WILLIAM AUSTIN, of Holywell-street, Westminster, for Improvements in the manufacture of tiles and tubes.—Dated November 19, 1853. Sealed May 16, 1854.

2712. ROBERT ADAMS, of King William-street, London, for Improvements in fire-arms.—Dated November 22, 1853. Sealed May 16, 1854.

2729. JOHN DRUMGOOLE BRADY, of Cambridge-terrace, Middlesex, Esquire, for An improved mode of or a new arrangement of straps for slinging knapsacks.—Dated November 23, 1853. Sealed May 16, 1854.

2796. JOSEPH DILWORTH, of Preston, Engineer, for Improvements in escape valves and safety valves.—Dated December 1, 1853. Sealed May 16, 1854.

2798. JOHN HENRY JOHNSON, of Lincoln's-inn-fields, Gentleman, for Improvements in the treatment or manufacture of caoutchouc.—Dated December 1, 1853. Sealed May 16, 1854.—(A communication.)

2837. JULIAN BERNARD, of Regent-street, Middlesex, Gentleman, for Improvements in machinery or apparatus for stitching or uniting and ornamenting various materials.—Dated December 6, 1853. Sealed May 16, 1854.

17. JULIAN BERNARD, of Regent-street, Middlesex, Gentleman, for Improvements in the manufacture of boots and shoes, part of such improvements being applicable to the manufacture of garments.—Dated January 3, 1854. Sealed May 16, 1854.

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Macintosh, Printer, Great New-street, London.

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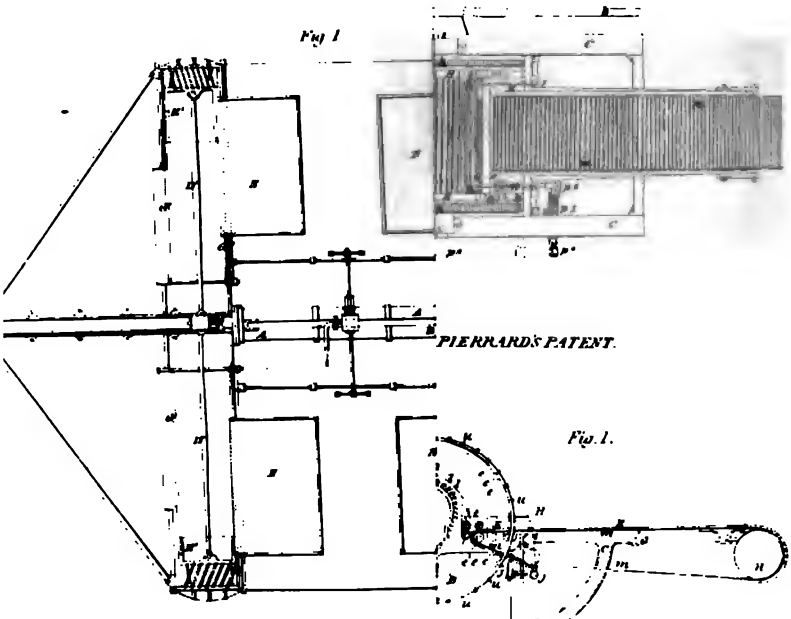

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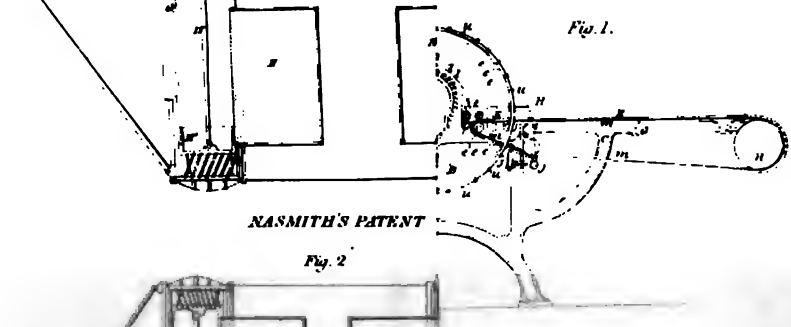

NASMITH'S PATENT

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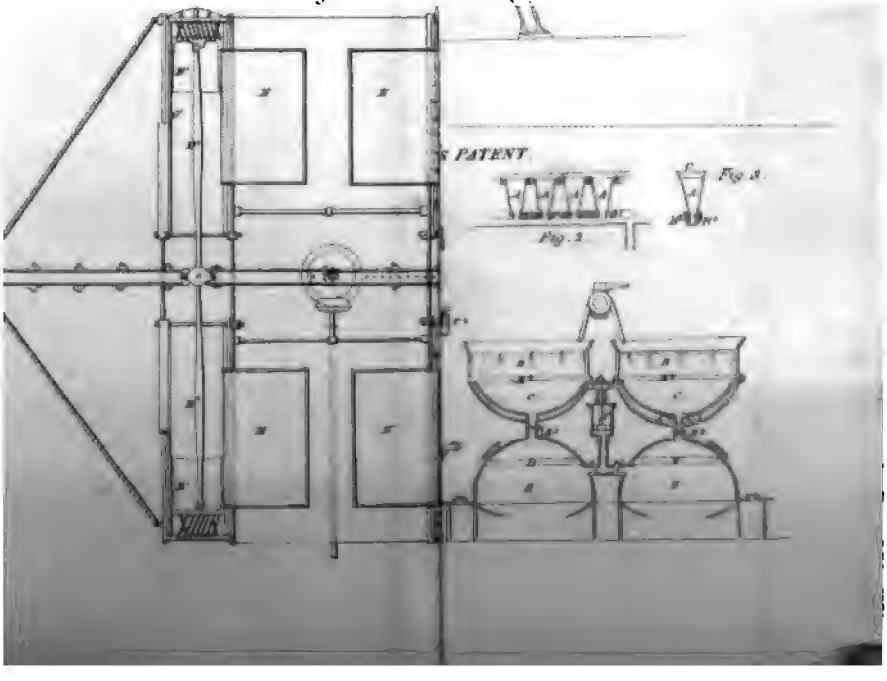

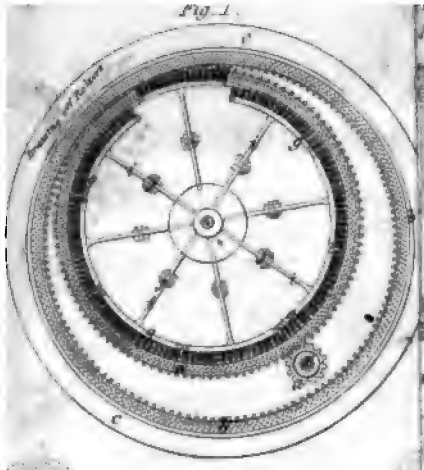

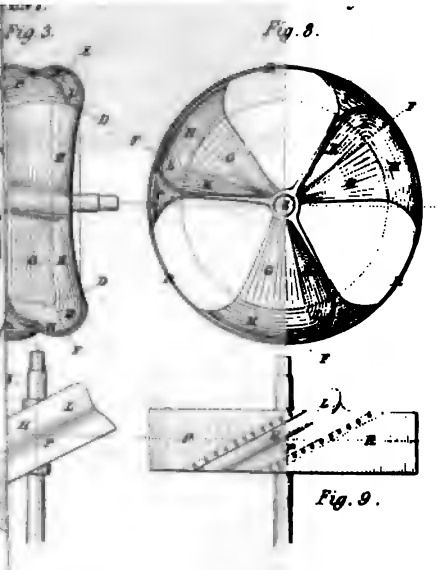

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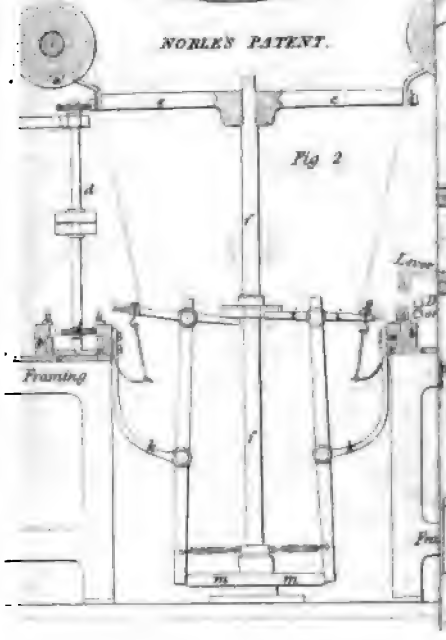

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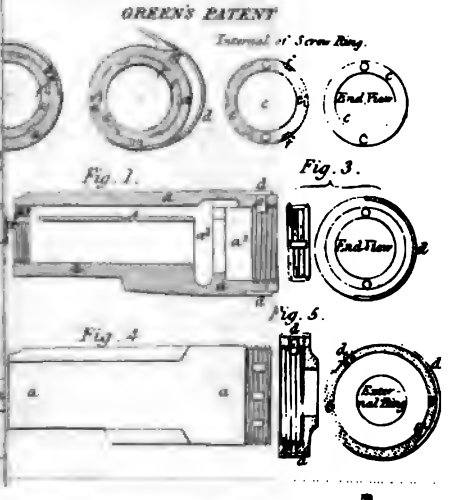

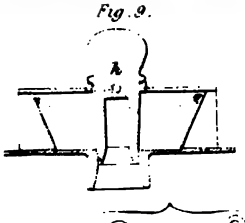

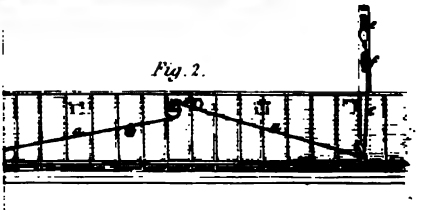

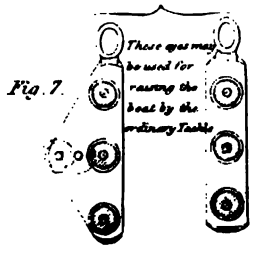

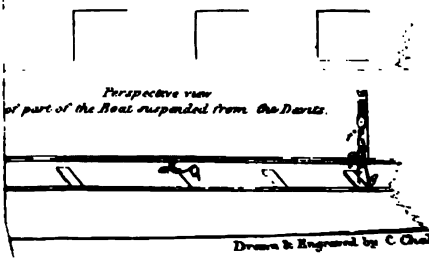

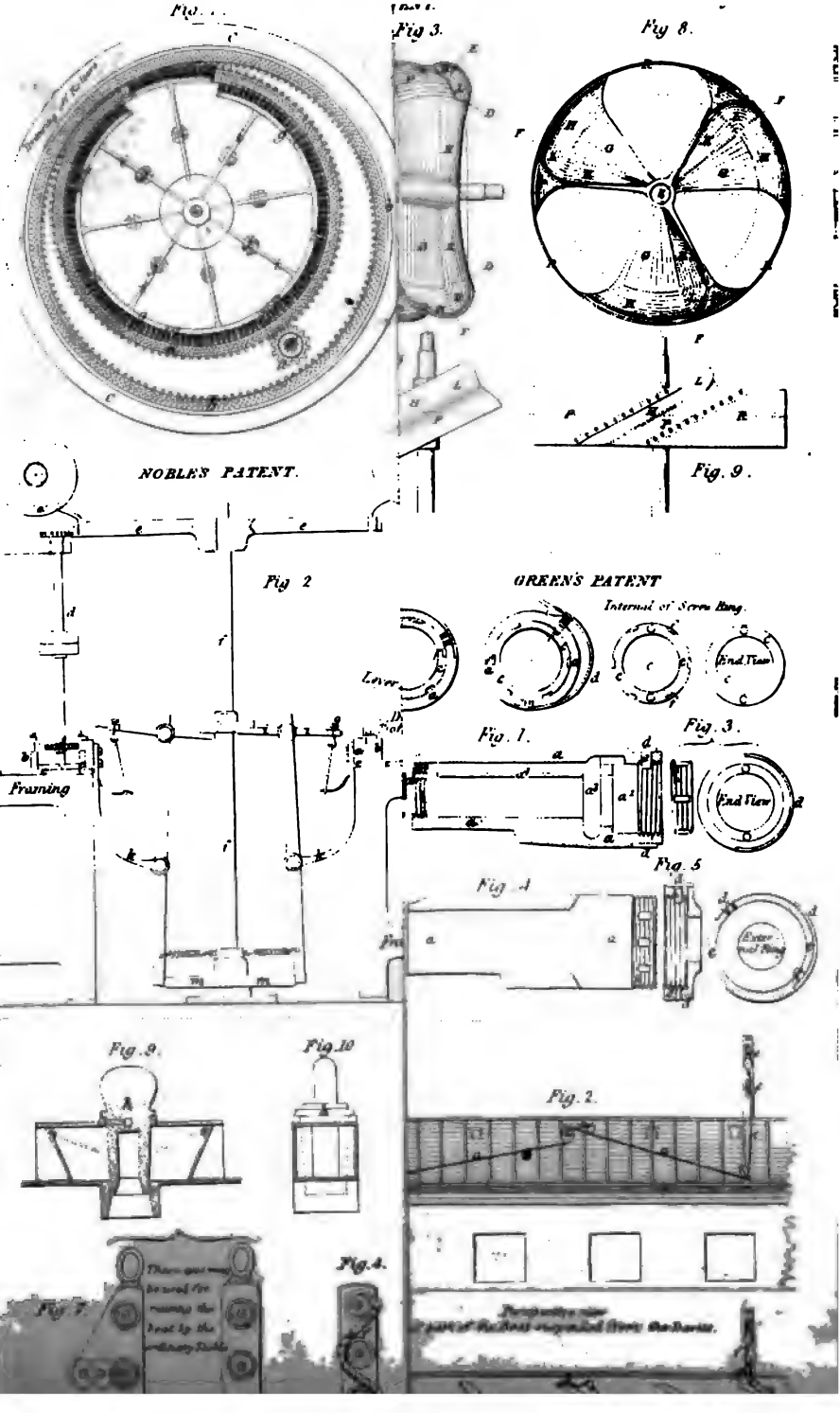
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Lever
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Fig. 4
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Fig. 1

NEWALL'S PATENT

Fig. 2

Fig. 1

Fig. 3.

Fig. 1.

Fig. 2.

DEELEY'S PATENT

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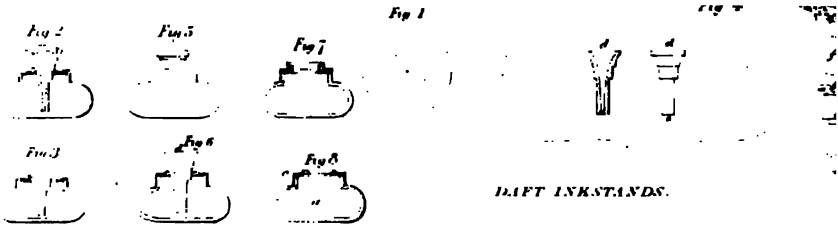

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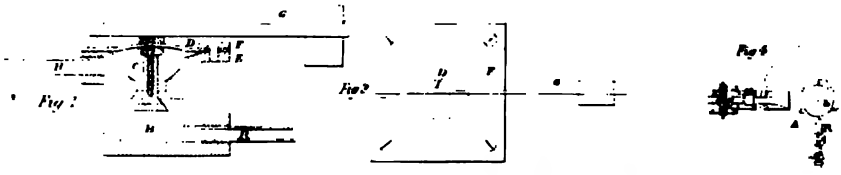
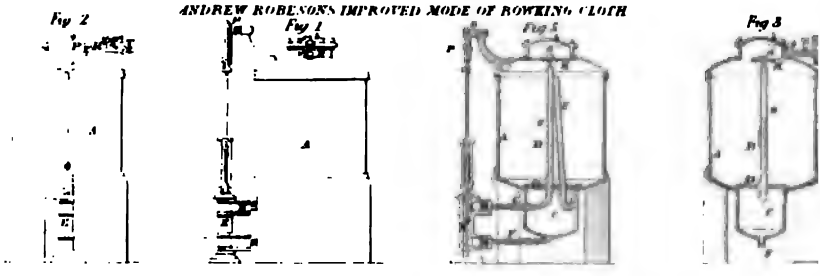


ANDREW ROBESONS IMPROVED MODE OF ROWING CLOTH



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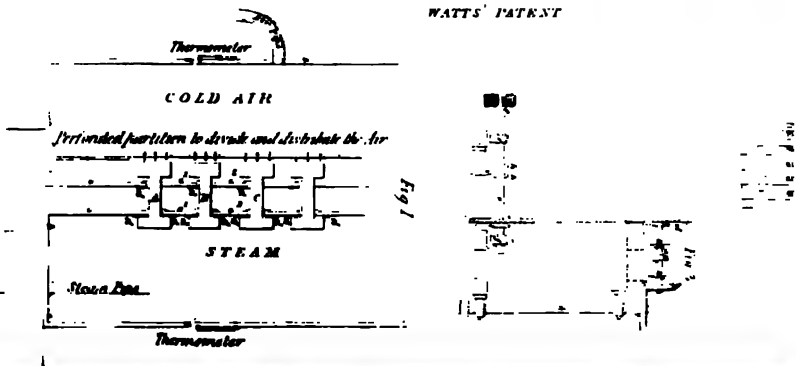

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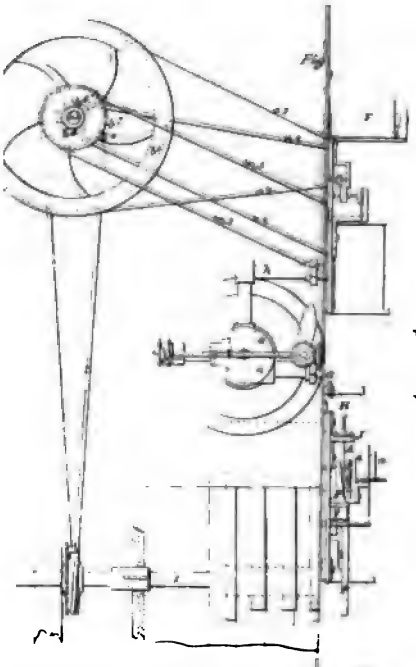

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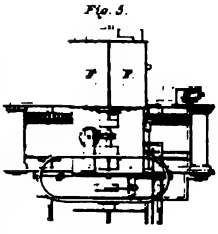

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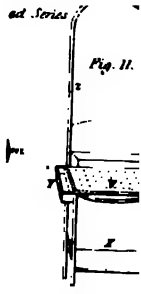

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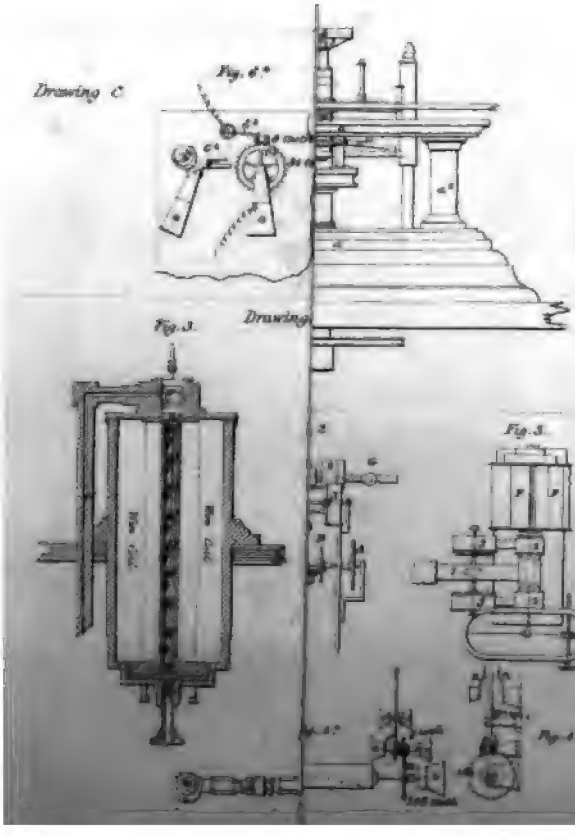
Drawing C.



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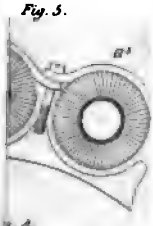

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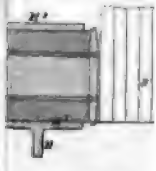

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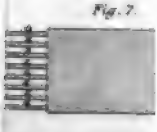

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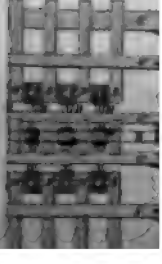
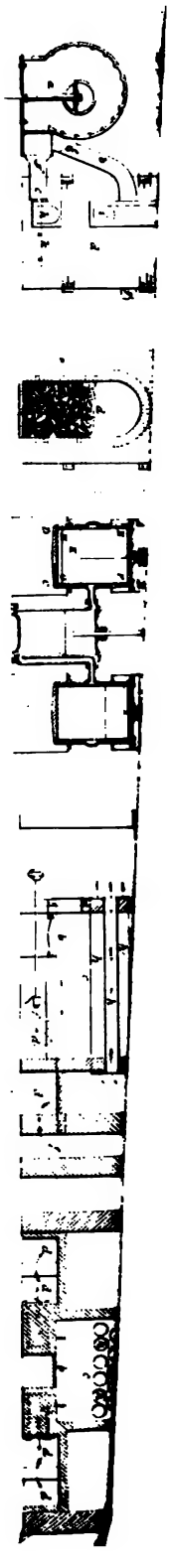
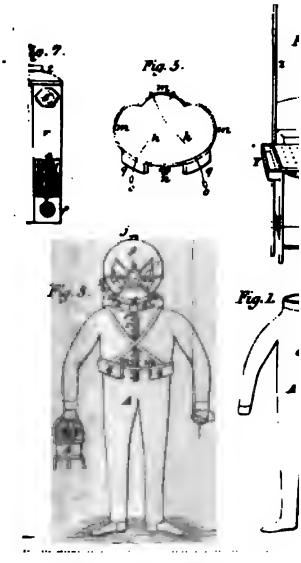
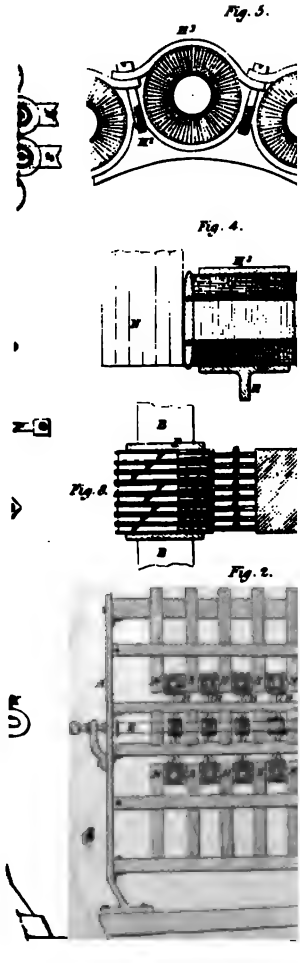






MARÉ'S PATENT.



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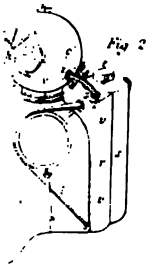
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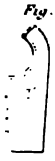
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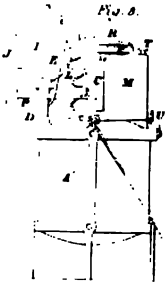
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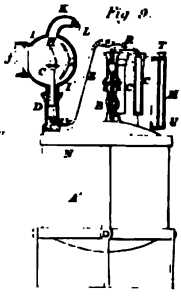
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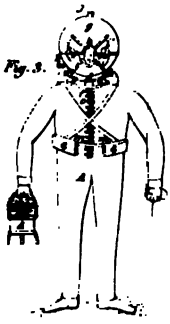
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WRATHBRENYS PATENT

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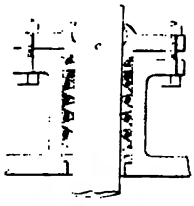

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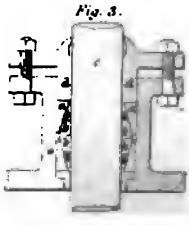
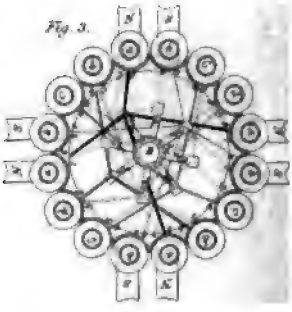


Fig. 4.

SHEPARD'S PATENT.

Fig. 3.



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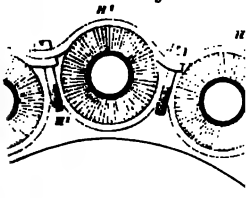


Fig. 4

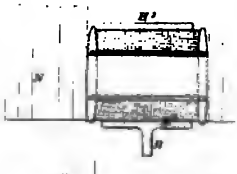
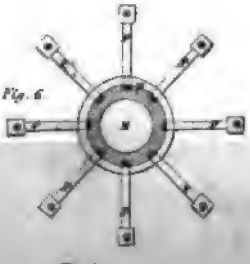


Fig. 6.



LOOKER'S PATENT.

Fig. 1.

Fig. 2.

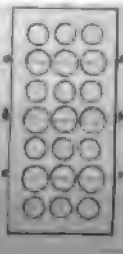


Fig. 3.

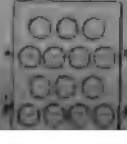
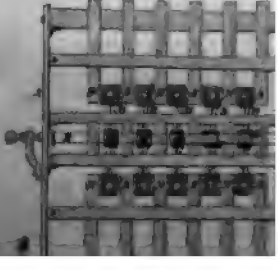


Fig. 1.

Fig. 2.



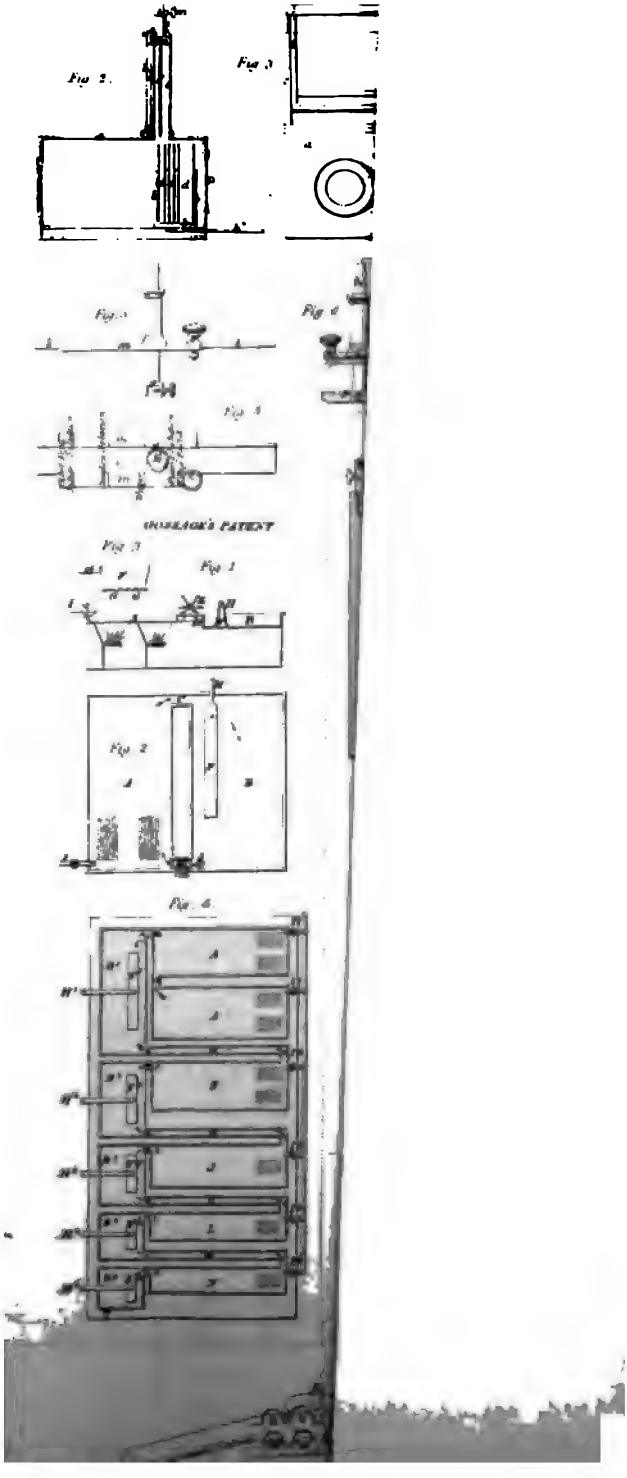


Fig 2.
Fig 3
Fig 4
GOSSAGE'S PATENT
Fig 3
Fig 1
Fig 2
Fig. 4.

Fig. 1.

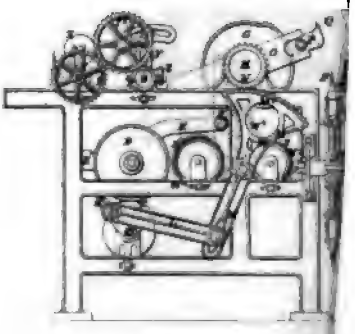


Fig. 2.

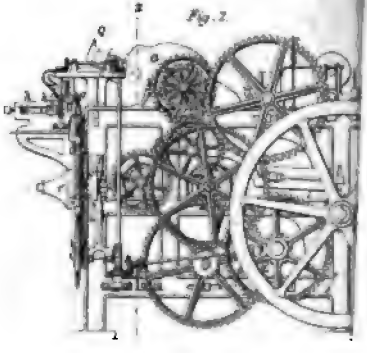


Fig. 6.

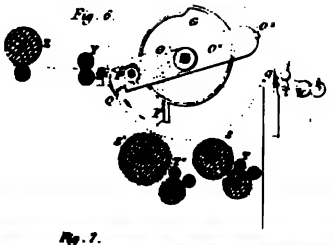
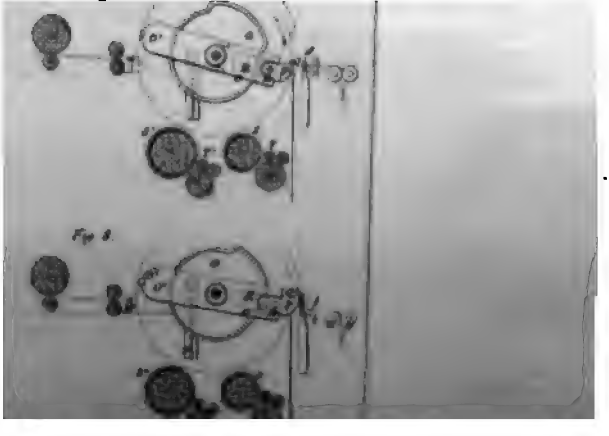
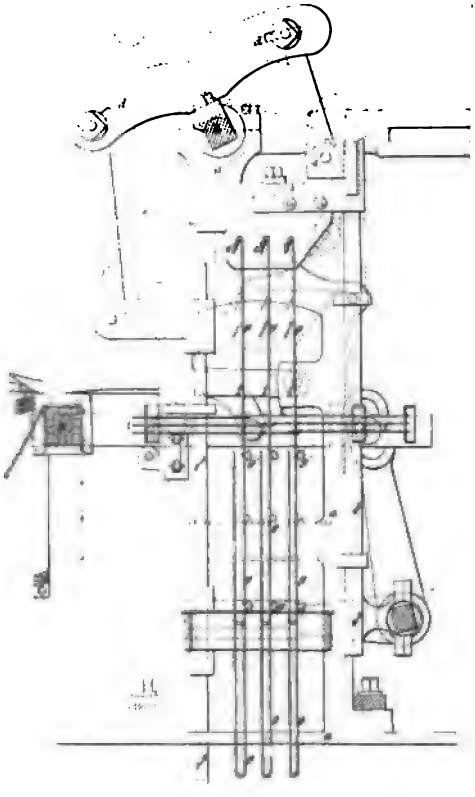


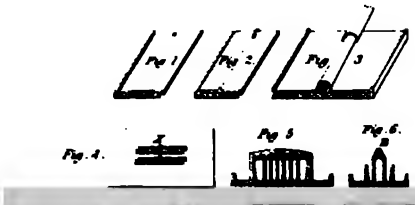
Fig. 7.

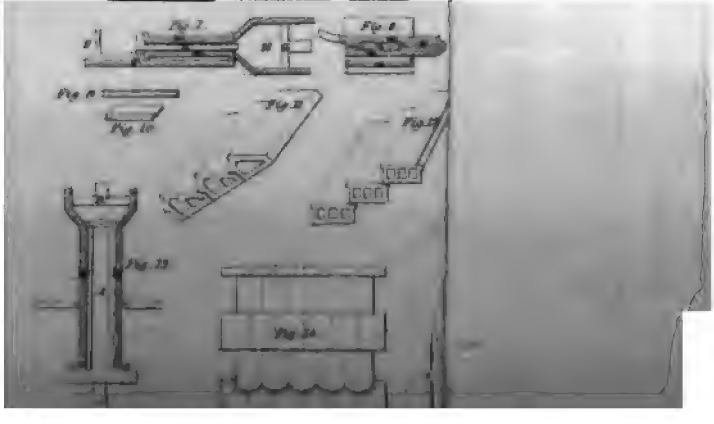


BURROW'S PATENT.



NORTON & BORIE'S PATENT.





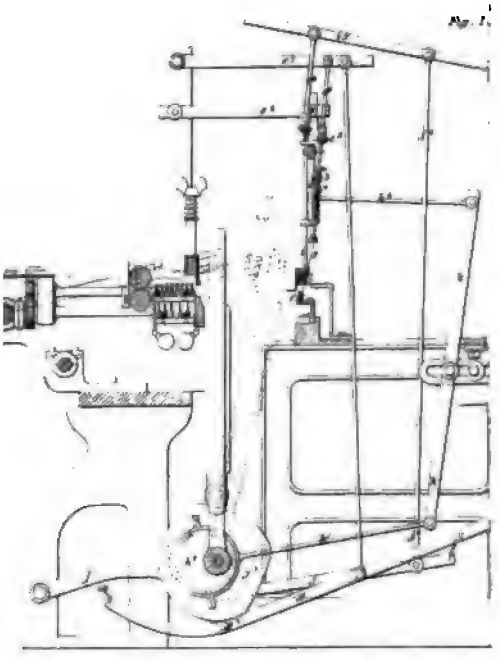


Fig. 7.

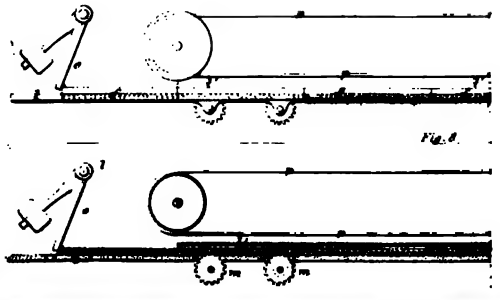
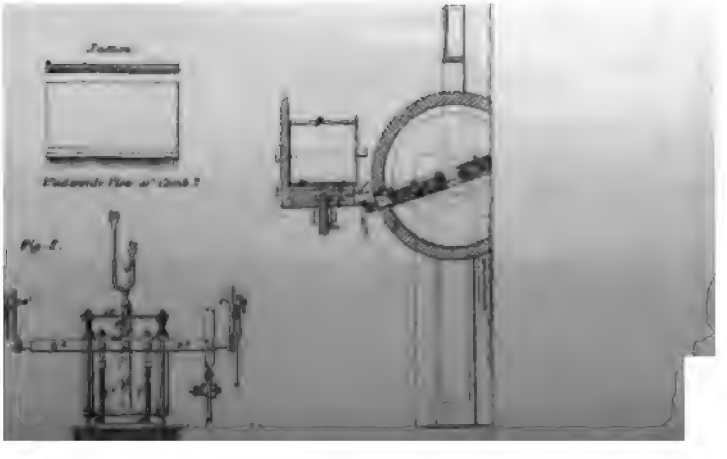


Fig. 8.



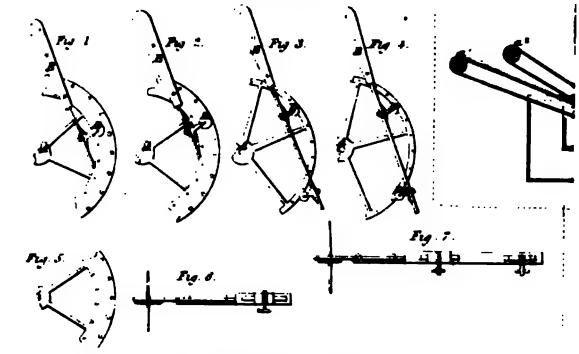
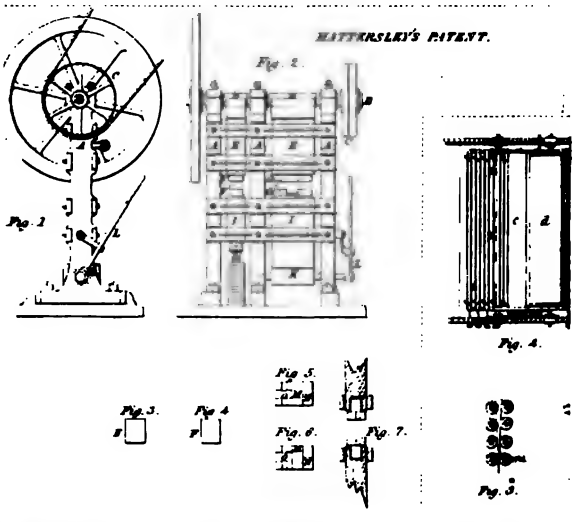
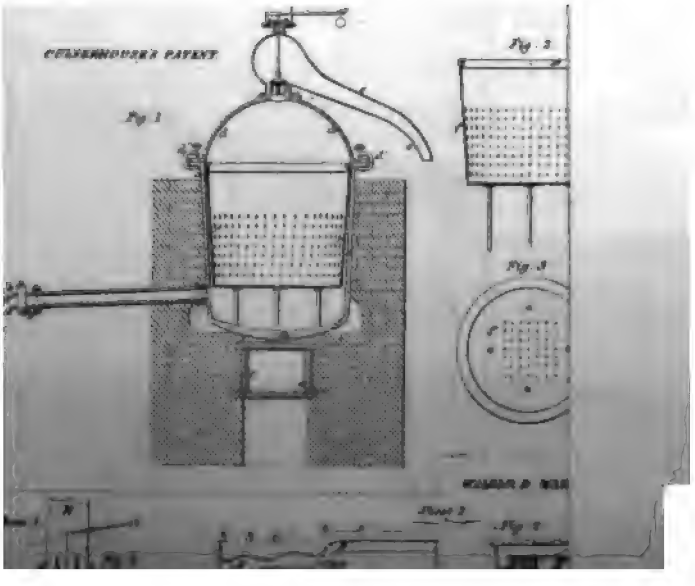
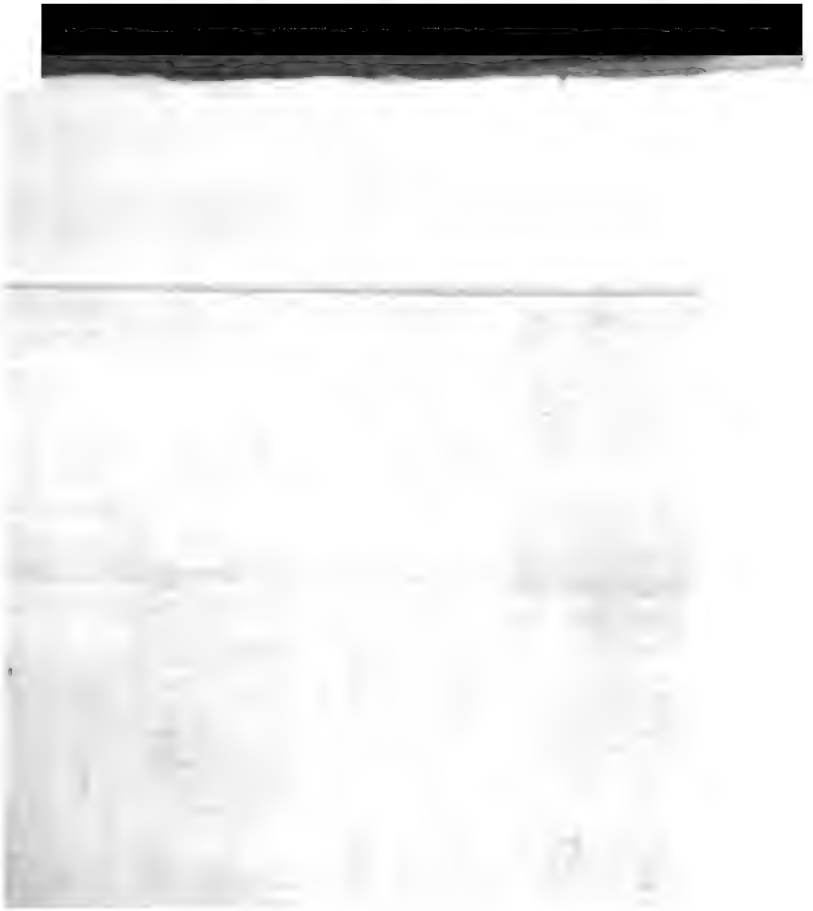
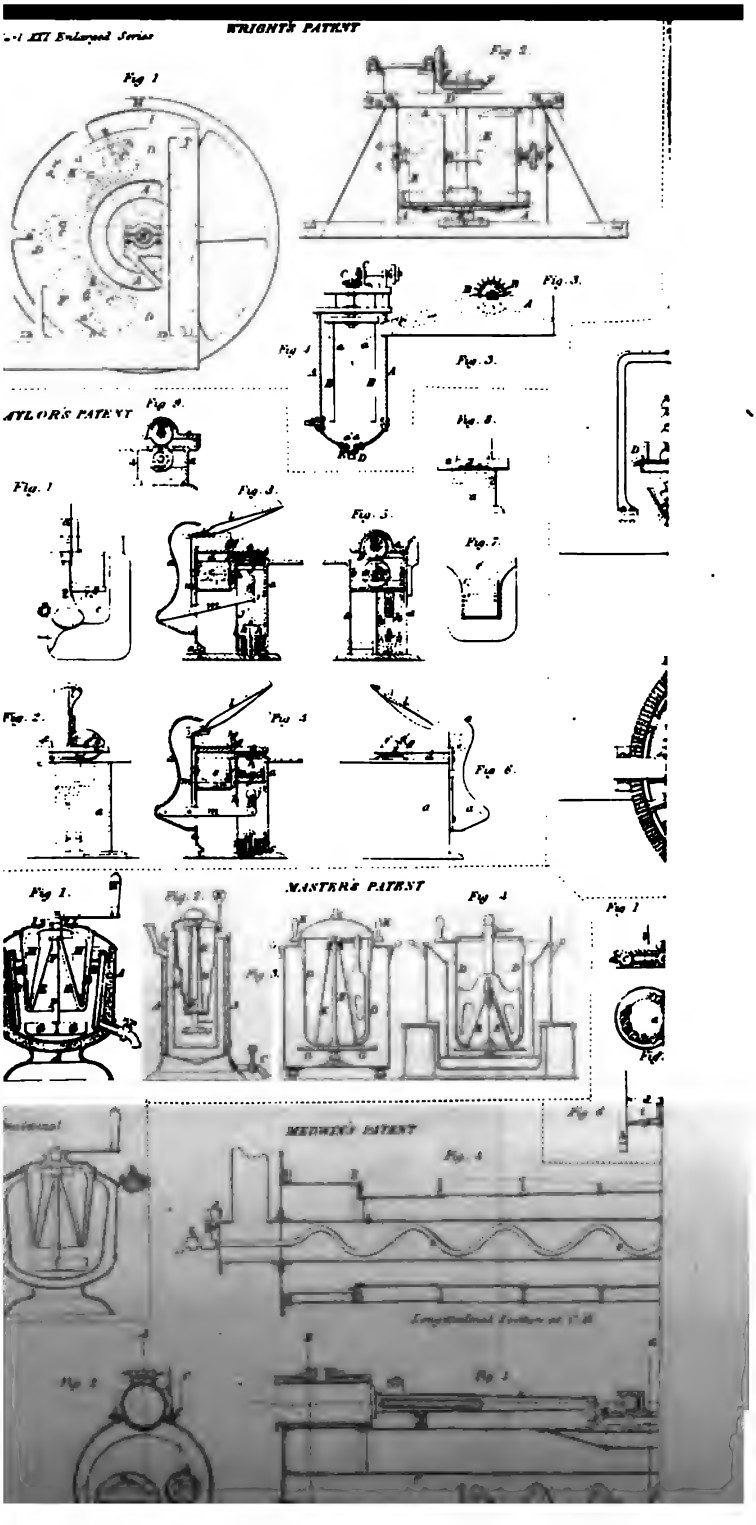


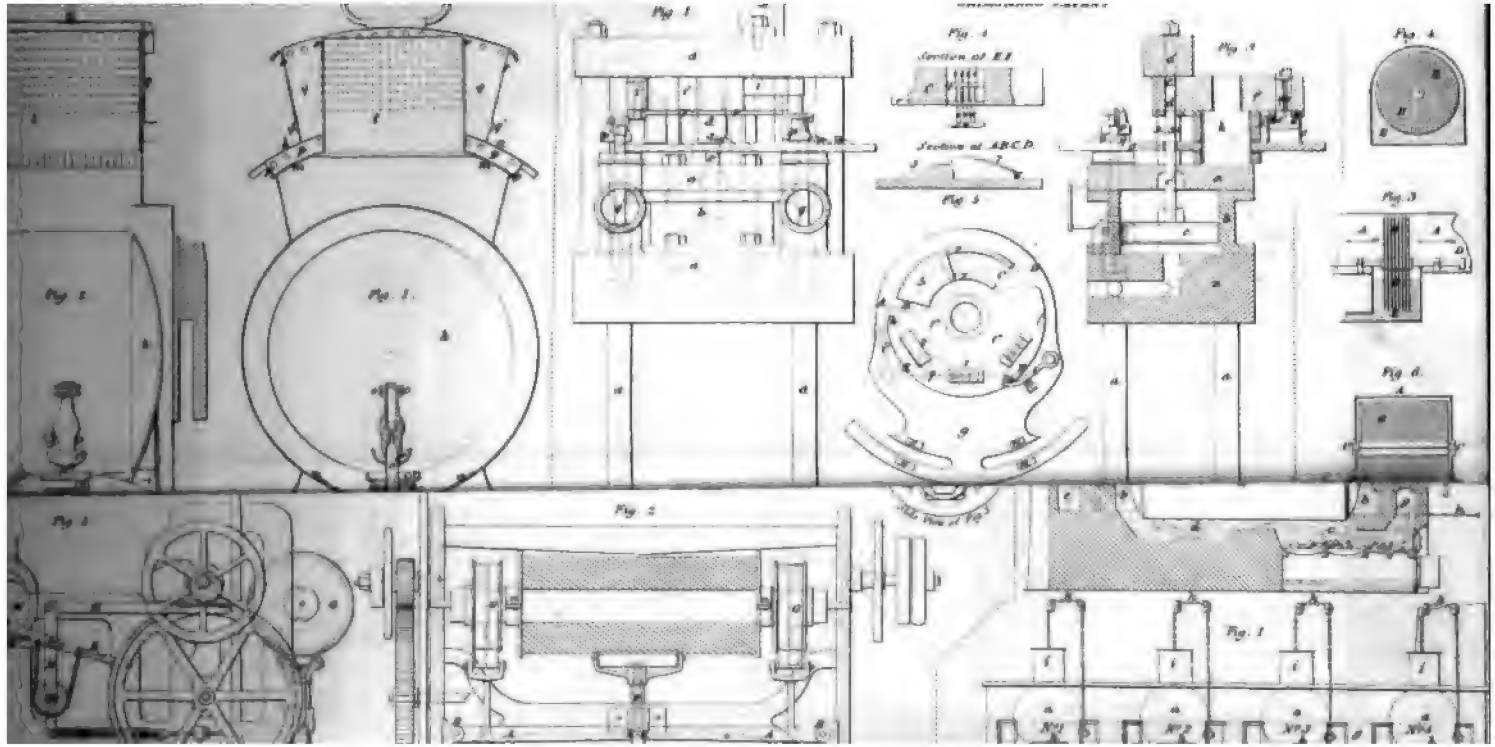
Fig. 1
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.

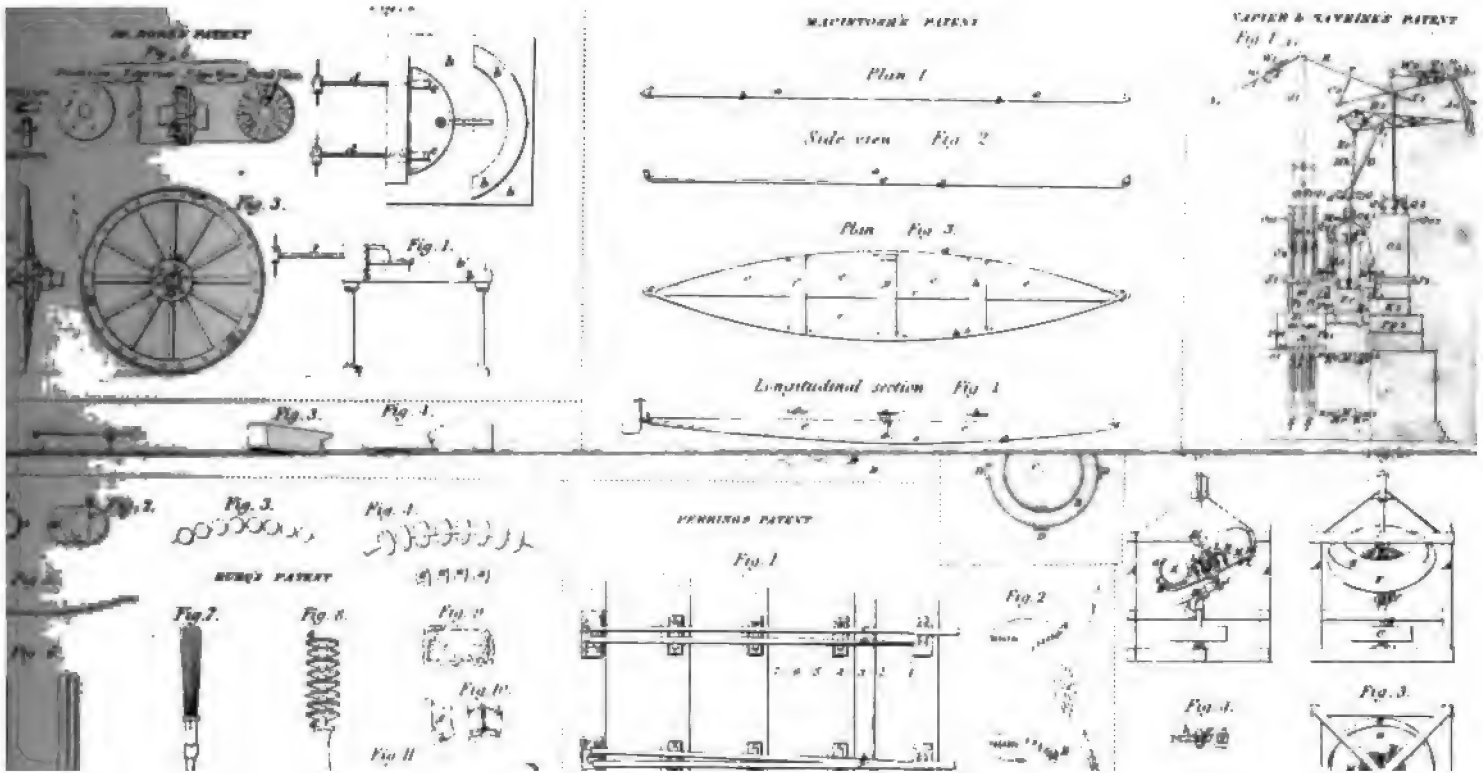

HATTERSLEY'S PATENT.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.


CULVERHOUSE'S PATENT
Fig. 1
Fig. 2
Fig. 3




WRIGHT'S PATENT
Fig 1
Fig 2
Fig 3
Fig 4
Fig 5
Fig 6
Fig 7
Fig 8
Fig 9
MASTERS PATENT
Fig 1
Fig 2
Fig 3
Fig 4
Fig 5
Fig 6
MEDWIN'S PATENT
Fig 1
Fig 2
Fig 3
Fig 4




MACINTOSH'S PATENT
Plan 1
Side view Fig. 2
Plan Fig. 3.
Longitudinal section Fig. 4
NAPIER & SAVRINE'S PATENT
Fig. 1
Fig. 3.
Fig. 1.
Fig. 3.
Fig. 4.
Fig. 2.
Fig. 3.
Fig. 4.
BURG'S PATENT
Fig. 7.
Fig. 8.
Fig. 9
Fig. 10.
Fig. 11
PERRINGS PATENT
Fig. 1
Fig. 2
Fig. 4.
Fig. 3.

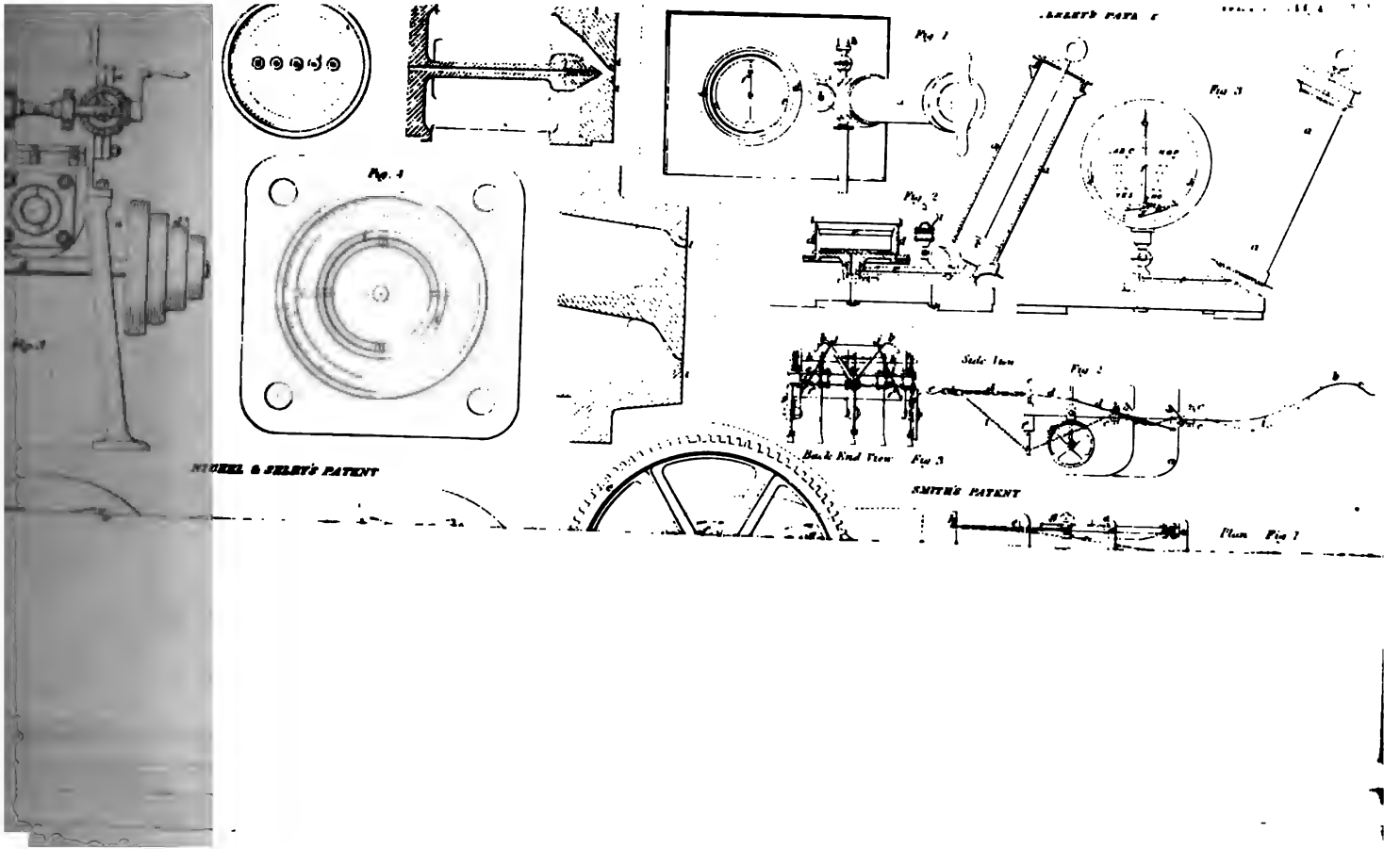


Fig. 1
Fig. 2
Fig. 3
Fig. 4
Side View
Back End View
Fig. 3
Fig. 2
Plan Fig. 1
NICHEL & SELEY'S PATENT
SMITH'S PATENT

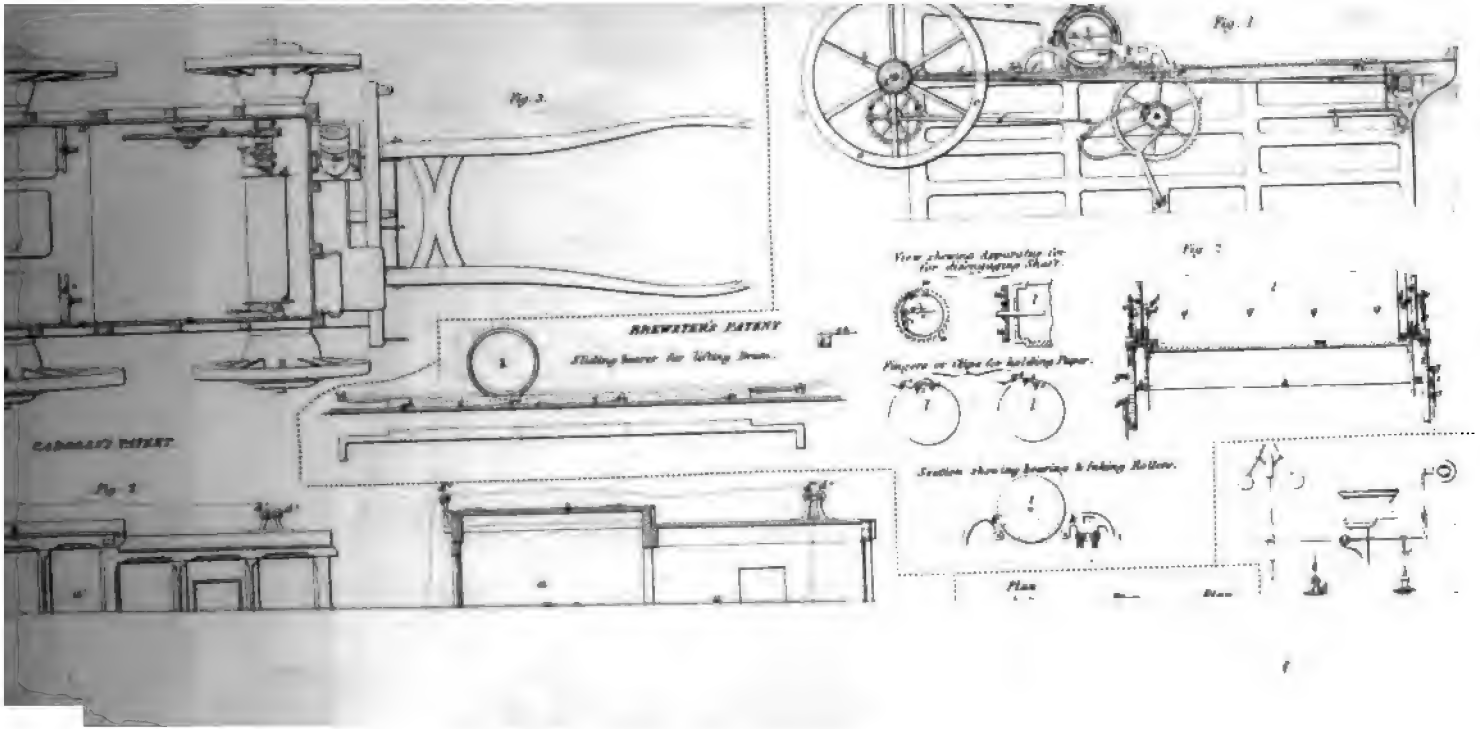
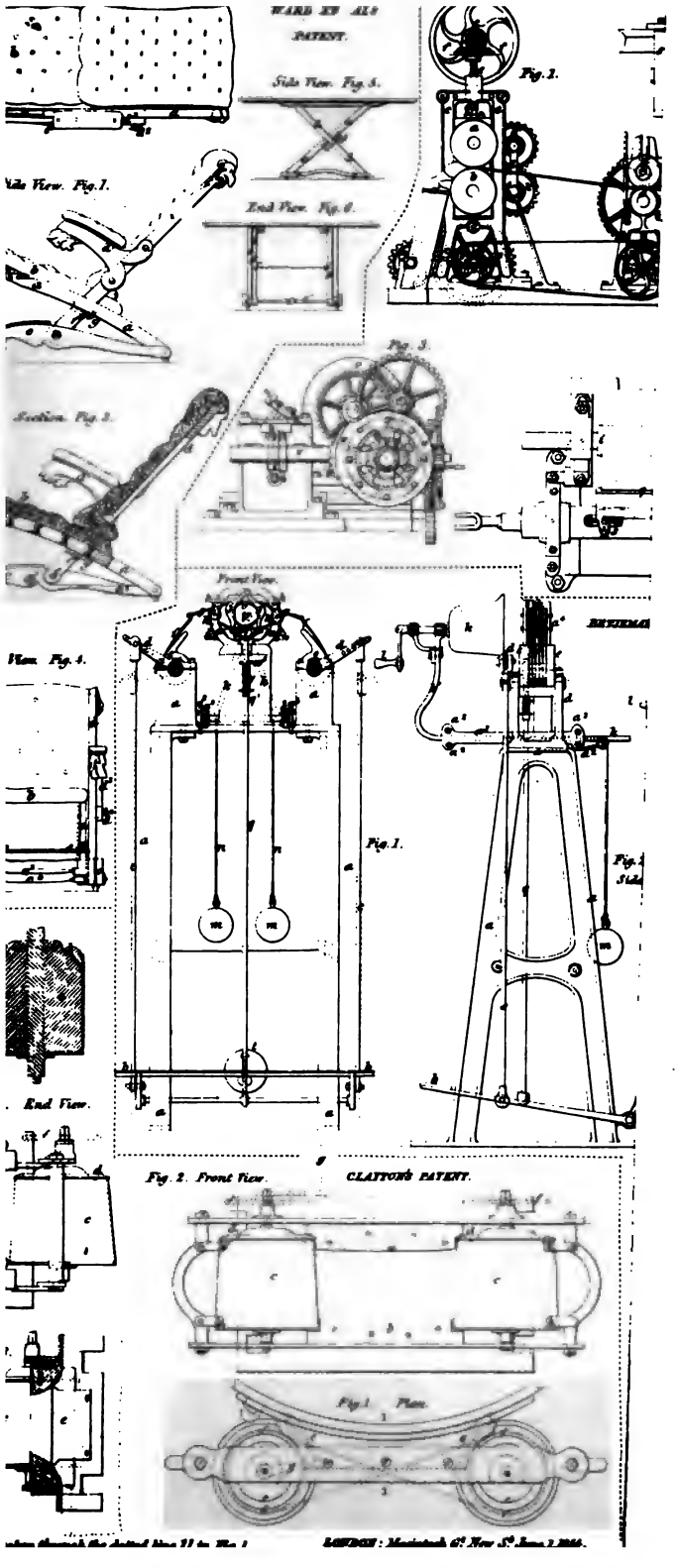


Fig. 1
Fig. 2
Fig. 3
BREWSTER'S PATENT
Sliding bearer for lifting Drum.
View showing Apparatus for for disengaging Shaft.
Fingers or Clips for holding Paper.
Section showing bearing & Inking Rollers.
Plan


WARD ET AL'S
PATENT.
Side View. Fig. 5.
End View. Fig. 6.
Fig. 2.
Fig. 3.
Front View.
Fig. 1.
Fig. 2. Front View.
CLAYTON'S PATENT.
Fig. 1. Plan.

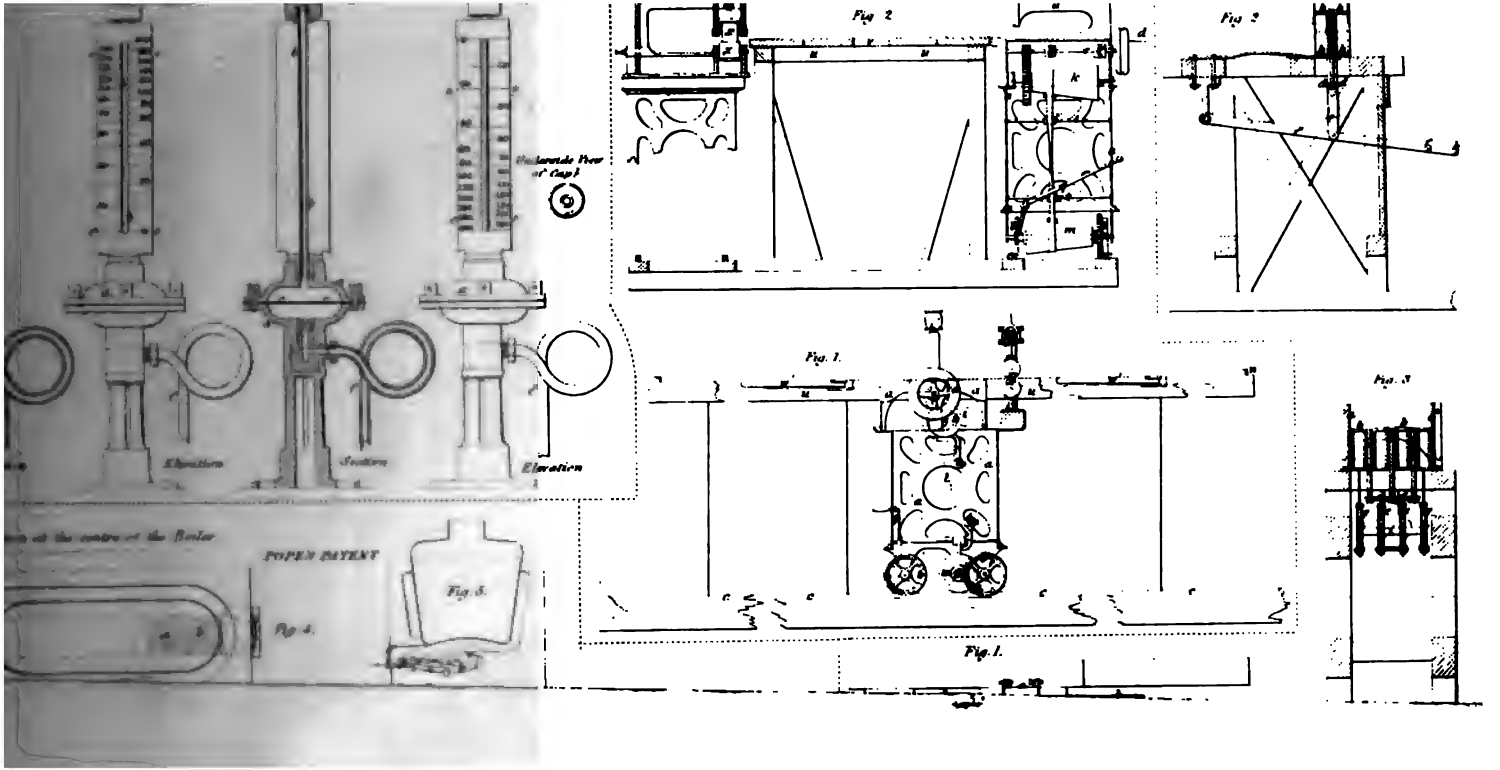


Fig. 2
Fig. 2
Fig. 1.
Fig. 3
Fig. 1.
Elevation
Section
Elevation
POPEN PATENT
Fig. 4.
Fig. 5.